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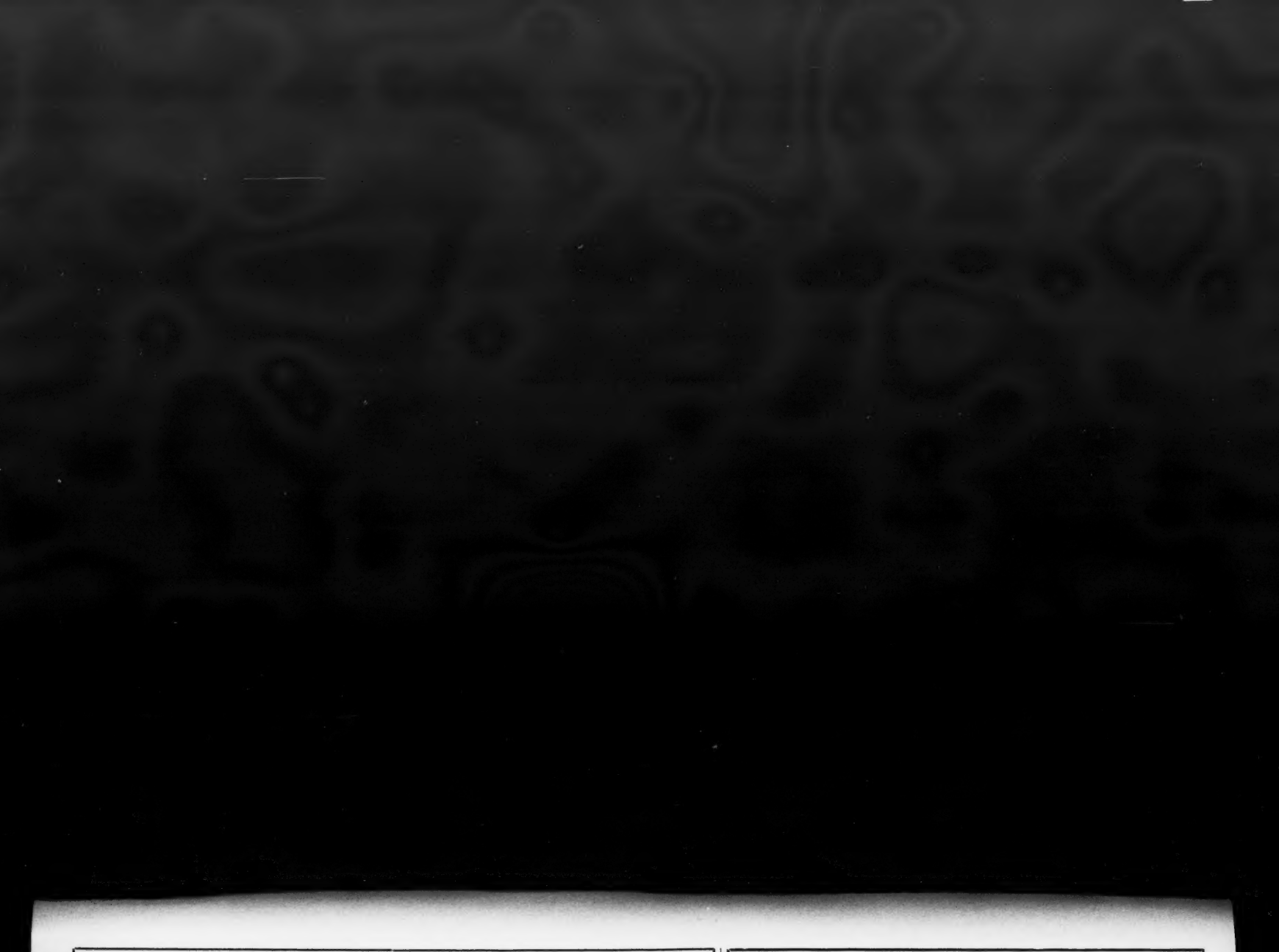

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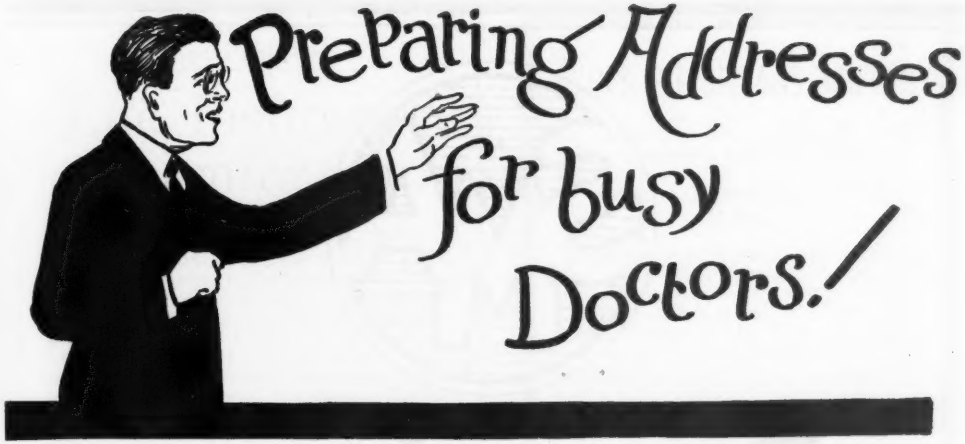

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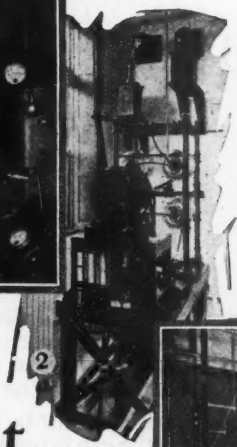

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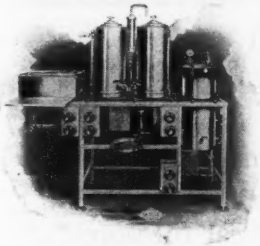

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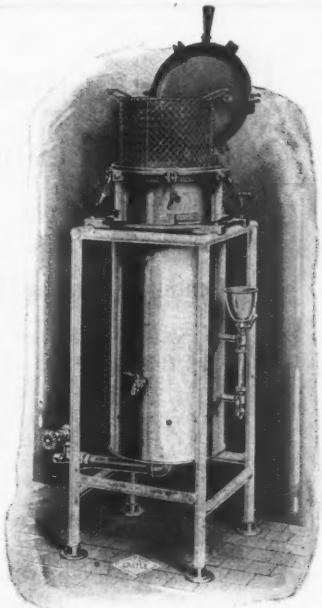

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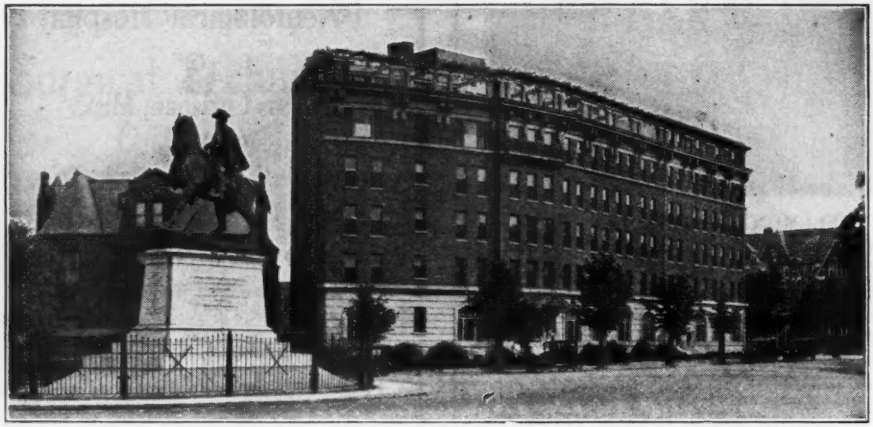

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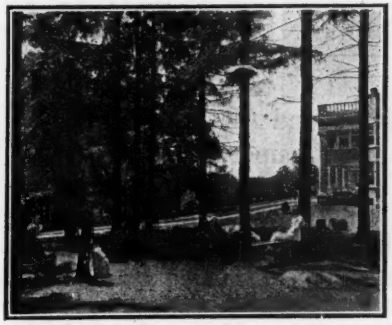

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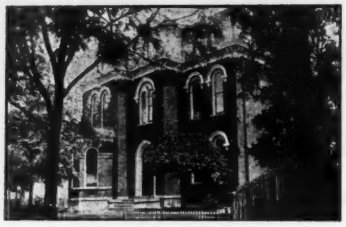

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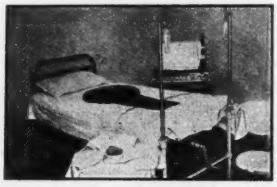

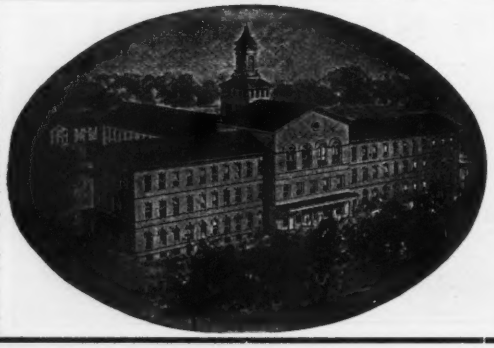

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

CHRONIC HEART DISEASE IN CHILDREN WITHOUT RHEUMATIC FEVER*†

By HUGH MCCULLOCH, M.D.,
St. Louis, Mo.

It must be clear to any one who observes a group of children suffering from chronic heart disease that they all do not show alike the same clinical picture or run the same course. On close observation one may recognize that individual children show widely varying signs and features. It is my purpose to direct attention to a group of children who have chronic heart disease who do not show signs of rheumatic fever, and who must be considered apart from children who have heart disease with rheumatic fever. It seems possible to differentiate one group from the other. No consideration will be given to congenital heart disease or to a small group of children who have subacute bacterial endocarditis, since these groups, though they are important, are rarely classed as rheumatic heart disease.

Before discussing these forms of heart disease it is well to define what we mean by rheumatic fever. Oftentimes the attack of swollen, red, painful joints migrating from one location to another and associated with fever is unmistakable in its nature and about it there can be very little discussion. However, in our Cardiac Clinic at the St. Louis Children's Hospital these children with such attacks of rheumatic fever form only a small proportion of the total number of cases. Much more frequently the history is that the child has had joint or muscle pains of an indefinite nature to which little or no attention has been paid. In between these two extremes of joint signs one may encounter all gradations of symptoms and signs related to rheumatic fever or rheumatism as it is so frequently called. What criteria should define rheumatic fever and within what limits of signs should one restrict the term rheumatic fever as applied to these children has been a matter of some difficulty for decision. It has been the experience in our Cardiac Clinic that children with rheumatic fever show the same objective signs as are seen in adults, and it has become our custom to limit the term rheumatic fever to those children who show any of the objective signs: muscle spasm about the joints and local joint redness or swelling or tenderness. The degree of fever, the presence or degree of anemia, the acid sweats and subjective pain cannot be considered objective signs distinctive of rheumatic fever. Rheumatic nodules, when they occur, have been considered as objective signs and are especially reliable in differentiating the case as one of rheumatic fever. In our cases these nodules do not occur frequently. They have been of importance in that they have been seen only when the prognosis was unfavorable.

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*From the Department of Pediatrics, Washington University School of Medicine.

†Read in Section on Pediatrics, Southern Medical Association, Seventeenth Annual Meeting, Washington, D. C., Nov. 12-15, 1923.

These children have a history of well-defined attacks of tonsillitis and one time or another, sooner or later, show signs of cardiac disease. There is ample evidence that muscle changes and rarely pericarditis have occurred, but evidence of endocarditis is constantly present and is very conspicuous. These children frequently have aortic valve disease. The incidence of cases of rheumatic fever with objective signs is confined largely to children over eight or ten years of age. It has been our experience that such children have little or no generalized infection in the nose or paranasal sinuses. The infection is apt to be localized in the tonsil, and after tonsillectomy they are relatively free from further infection in the nose or throat. These children usually show considerable improvement after operation, though the heart changes vary but little. St. Lawrence[1] has reported, however, that rheumatic fever does recur after complete removal of the tonsil.

By far the larger number of children attending the Cardiac Clinic do not present any such picture as that described above. In contra-distinction they show no objective signs of inflammation in or about the joints, though they frequently complain of subjective soreness, pain, stiffness or lameness about the joints, particularly of the lower extremity. These subjective symptoms are often referred to the muscles of an extremity rather than to the joint and may be called growing pains, muscular rheumatism or what not. These children may be eight years or more of age when they come under observation. The symptoms are equally common as early as four or five years before that period. There is an unfailing history which dates back to early childhood of bad environment, repeated colds and upper respiratory infections, and increasing malnutrition with all the symptoms attendant on these conditions. The predominating symptom has been manifestations of fatigue. The heart disease has been discovered more or less accidentally, either at school or during the course of routine physical examination of the whole body. It is only occasionally that the case has progressed so far as to show signs of advanced heart disease or cardiac failure.

The physical signs obtained from examination of the heart indicate invariably changes in the myocardial tissue. There are usually signs of insufficiency of the mitral valve or even of stenosis. We have not seen signs of aortic valve disease in this group of children. Under observation over periods of time, these valve signs may change rapidly for better or worse, and to a greater or less extent depending upon the changes in the cardiac muscle tissue. We have seen children with signs of well marked mitral stenosis and cardiac enlargement of three to four centimeters, who, after three months of proper care, showed only doubtful cardiac enlargement with no signs of mitral stenosis even after strenuous exercise.

It seems to us probable that the physical signs of changes in the valve leaflets or rings are produced by alterations in the relationship of the leaflets and the manner of their closure rather than to any actual anatomical structural changes in the valve tissue. These functional valve changes are dependent for the most part at least on the changes in the muscle tissue and subsequent effects on the circulation. The rapidity and the completeness of changes in the valve signs make it unlikely that any structural alteration in the valve could have been present. When the hearts are examined after death structural changes may be found, but these are in the children who died and are the result of continued infection in the heart or form part of a terminal infection. There seems no conclusive way at present of determining the extent of structural damage to the heart valves in those children who run a favorable course and eventually recover or are restored to normal life with a slight cardiac handicap.

At the present time the changes in the heart muscle are but imperfectly understood. Cardiac enlargement is the one constant finding in all the children, and it is our opinion that this should be taken as evidence that changes have taken place in the heart muscle tissue.[2] This evidence, though presumptive only, is reliable. Other evidences of clinical myocarditis, so-called, are usually lacking.

These children have a moderate degree of secondary anemia, and a normal white

blood cell count or slight leucocytosis. It has not been possible to recover from the blood by culture any bacteria which might be an etiological agent, nor have we observed evidence of bacterial metastases except as terminal phenomena.

These children who have heart disease without objective signs of rheumatic fever present important signs of infection in the nose, paranasal sinuses and tonsils. Without exception in our cases there has been recognizable infection in the tonsils and it is our custom to recommend tonsillectomy in every cardiac child whether he has rheumatic fever or not. But we feel that this infection forms only a part of a more generalized infection in the nose. Indeed, it seems at times that the tonsillitis may be only secondary to the infection which is present elsewhere in the nose, especially the paranasal sinuses. Recently attention has been directed to the occurrence in this location of chronic infection by Dean,[3] Arbuckle[4] and other workers. In this group of children with chronic heart disease without rheumatic fever we have observed such an infection in a very high percentage of cases. A certain number of other children show widespread infection in the mucous membrane throughout all the nasal and pharyngeal space. The mucous membrane is thickened, there is increased redness, and the normal smooth appearance is replaced by a roughened, corrugated membrane. This is partly due to the increased size of the normal lymph follicles here and there in the mucous membrane. There is usually an excess of purulent secretion in the nose and nasopharynx. There is most often a combined infection of the mucous membrane and sinusitis. The maxillary sinus is most frequently infected, though the frontals, ethmoid or sphenoid cells may be the seat of trouble.

It seems probable that some poison, whether it be bacteria, toxin or some other by-product of this infection in the nose, is liberated into the lymph spaces and gains entrance into the circulating blood to reach a distant region and produce an effect on some specialized tissue such as heart muscle, kidney, brain or liver. Already evidence has been found that unusual substances may be recovered from the body of these children which exert a recognizable effect on specialized cells.[5]

The relationship between this form of chronic heart disease and infections in the nasal space and paranasal sinuses is close and should be clearly borne in mind in instituting care of such a child or in estimating the prognosis. The focus of infection must be cleared up properly and under frequently repeated observations must be kept cleaned up. When this can be accomplished the child gains in weight, the symptoms of fatigue disappear and eventually the heart decreases in size. The sounds approach normal quality, murmurs disappear and a generally favorable progress ensues. Oftentimes, sadly enough, such foci of infection remain undiscovered or do not respond to local treatment and such a favorable progress does not ensue. The course may be continuously from bad to worse; the joint pains continue or become worse, there is no gain in weight, the heart becomes larger in size and weaker in efficiency, eventually cardiac failure is apparent, nephritis is added to the list and death occurs.

Many children with chronic heart disease show chorea and occasionally there may be acute nephritis. Or these two diseases may appear first and the heart disease come as a later development. The relationship between these four conditions, heart disease, nephritis, chorea and joint pains and infections in the nose and throat has long been recognized. It is sufficient at this time merely to direct attention to the relationship again in children. At any rate, the trouble starts in the nose or throat and one or the other of the four structures proves to be the point of least resistance and breaks down under the strain.

Briefly, then, attention is directed to the fact that children suffer from chronic heart disease which is the result of changes in the heart muscle tissue. These changes in turn are due to the action of some poison liberated from foci of infection. This focus is usually to be found in the nose and its accessory sinuses, as well as in the tonsils. Many of these children recover to such an extent that they may have no further cardiac trouble and may

be restored to normal health. These children may show characteristic rheumatic fever with objective signs in the joints, but more commonly the signs are lacking, though there may be joint or muscle pains. These children should not be considered to have rheumatic fever.

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DISCUSSION

Dr. Edward Clay Mitchell, Memphis, Tenn.—I know of no phase of our work with children where we find less uniformity than in the classification and treatment of chronic heart conditions.

Some years ago I was connected with a department of school inspection in Memphis and saw many cases of seemingly bright children who did not get along with their work. They would loll around in school; they would not play with other children on the outside and they were kept out of school for colds. Physical examination would show cryptic tonsils which we fear more than large tonsils. After these children were sent home to their physician or to the clinic and the tonsils were removed, there would be some improvement for a while and then the patient would get into the same condition. Some of them were put in fresh air schools with some results. We thought perhaps there was a focus of infection which we were not locating. After the influenza epidemic in 1917 and 1918 we noted an increased number of cases that developed chorea and the like and in 1920, owing to the large number of these cases which we were seeing, in connection with Dr. John Shea we began a systematic routine examination of this type of case. We started in with a general physical and roentgenological examination. X-rays were taken of the chest and sinuses anteroposteriorly and laterally. We have now finished about one hundred cases of this type and we have come to the following conclusion regarding this type of infection: the roentgenological examination shows very much as the Doctor has said, a heavy, swollen, boggy looking mucous membrane particularly of the nasal cavity and pharynx, and particularly is this true where the tonsils have been previously removed. The condition seems to be about the same regardless of whether the tonsils have been removed or not. In many cases we find no nasal discharge or blood. The discharge when present is purulent and mucopurulent.

I was very much interested yesterday by the statement made by Dr. Barbour in his classification of fever that the sinus had only recently been considered because we thought the sinus was not sufficiently developed in children. It has been brought out by roentgenologists that the ethmoid cells are present at birth in two distinct anterior and posterior groups. The sphenoid sinus is single. It begins to develop at three years and continues to develop until ten years. The frontal is absent at birth and begins to develop at the end of the second year, and depending upon whether it is diseased or injured develops up until the age of twelve or longer. This frontal sinus is produced by the migration of the anterior ethmoid cells into the frontal bone. Disease seems to prevent its migration and inhibits the growth of the frontal sinus. The sinusitis we see is of two types: the cystic or acute type and the chronic type. We have examined a number of children beginning with the young baby and repeating yearly, not only seemingly healthy children but diseased children, including syphilitics and tuberculous children, and we have found that where the disease begins early in life we have a persistence of the infantile type; that the frontal sinus at twelve years is poorly if at all developed; that the ethmoid and sphenoid are undeveloped and are more or less sclerotic. I mention this because it may account for some of the chronic cases that do not seem to clear up even under treatment. The treatment of the sinuses in our work has brought in most cases fairly prompt results. They have been found to clear up fairly rapidly.

Dr. McCulloch has said that in their Clinic they find a large number of maxillary sinuses. In our work we have seen more of the ethmoid, particularly in younger children. We have seen the ethmoids produce actual pus.

I feel that the neglect of the sinus in many cases has accounted for our failure. The sinus, if neglected or not recognized, may produce a sclerotic condition which is difficult of cure. Mullen states that drainage from the sinuses is into the right side of the heart by way of the deep cervical submaxillary and cervical lymph duct. This actually produces dilation and, as Dr. McCulloch said, affects the heart muscle, producing in many cases the condition of heart muscle disease. I like the term "functional valve disease," because we do not always find a definite valve lesion. I think the sinus is responsible in many instances.

We are beginning to find out that the type of diet used in young children has something to do with the prevalence of nasal infection. We are inclined to believe that children fed on high

sugar diets have a greater number of these infections. That will have to be worked out.

Dr. G. C. Robinson, Baltimore, Md.—Dr. Crowe recently demonstrated before the Johns Hopkins Hospital Medical Society the changes that take place in the tonsil when it is chronically infected. He showed sections of the normal tonsil and its crypts. The crypts are quite deep and narrow and are lined with epithelium filled with blood vessels. When the tonsil becomes chronically infected a change takes place, which he demonstrated by sections, the crypts being distended and filled with purulent material and the epithelial lining of the crypts in part or entirely disappears. The outlines of the crypts are indistinct because of this purulent material. There are many small blood vessels in close contact with the purulent material in the crypts. I was very much struck by the opportunity for the passage of infection into the general circulation. This demonstration by means of actual sections offers the best explanation of the relation of chronically infected tonsils to the general infection that may be kept up constantly, such as we see in certain types of arthritis. This condition in the tonsils may represent the portal of entry for the causative agent in rheumatic or infectious types of heart disease the prevention of which is of such great importance. It seems to me that what we saw in the sections Dr. Crowe presented was the best argument for tonsillectomy as a preventive measure that I know of.

Dr. S. G. Glover, Greenville, S. C.—In three cases of heart condition recently in my practice the tonsils were suspected but not removed. One case was caused by syphilis, we later learned, and upon treatment for that condition the heart lesion cleared up. In the other two it was proven that the heart condition was caused by a hookworm infection, and after hookworm treatment the heart lesions cleared up. The three cases were entirely well in three months, there was no evidence of a heart leak, and the tonsils were not removed.

Dr. McCulloch (closing).—I did not mean that sinus infection was the cause of all heart disease. I recognize that there are many other causes. Hookworm is a new one to me and I am very glad to hear about it. One important thing I wanted to bring out is the age at which these infections occur, for in the early recognition of these infections lies some hope for prevention of heart disease. If we wait until our children have an organized and definite heart disease the outlook is not so good. It is very true and it is very gratifying to know that a great many of these children do improve rapidly. The cause of heart disease in young children must be ascertained and if the sinuses are found to be infected they must be treated.

A TREATMENT OF EPIDERMOMYCOSES OF THE FEET AND HANDS*

By ANDREW L. GLAZE, M.D.,
Birmingham, Ala.

Arthur Whitfield wrote to the Editor of the *Archives of Dermatology and Syphilology* in 1920:

"I am constantly searching for an application which will reach the mold through the thick horny layer of the foot and hand, but so far I have not had complete success."

This paper reports a series of 74 cases prepared for treatment by a method which takes the offending barrier away before "specific" antimycotic medication is undertaken. It is prompted by the satisfying results obtained, as compared with those secured in a previous succession of 111 cases attacked by the recognized therapeutic procedures in vogue.

It should be stated that no originality is claimed for the formula. Corn doctors as well as dermatologists were using it before the writer was born. Attention is merely called to a method of application in a particular condition.

In the interim between the acute outbreaks which usually characterize vesicular tinea of the feet, the epidermis may be removed with a paste of strong salicylic acid, much of the offending fungus or mold coming away with the cast off skin.

The formula, properly prepared, that is to say, properly weighed and mixed, is of the consistency of stiff Lassar's paste. It is almost putty-like; and once on the skin, it clings with astonishing tenacity. This point of consistency is dwelt on, for a paste too soft will inevitably damage the thin skin on top of the foot and produce needless discomfort.

Formula (all by weight):

Salicylic acid	ʒ ii—iiss
Starch powd.	ʒ ss—i
Petrolatum	ʒ iii

With this formula, the proper physical consistency may be maintained, whatever

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variations in salicylic acid content are made, by adding or taking away a weight of starch equaling that of the drug varied in strength.

Unfortunately, few solid petrolatum jellies on the market are of exactly the same density. Some are thin, some semi-liquid almost. Difficulties with the formula may always be laid to an unusually thin petrolatum, or to the fact that the druggist did not weigh this ingredient.

After thirty to fifty hours' application, depending on the strength of the preparation and the thickness of the sole, separation occurs in two to fourteen days or longer, the epidermis in an average case coming away in finger nail to palm sized fragments by the end of a week. That of the heel and the ball of the foot is the last to loose moorings, and the dry, shiny skin left, soft as a baby's foot, undergoes a gentle secondary desquamation itself a week or so later.

This procedure, considering the disturbance of structure, is remarkably non-irritating. A mild, red, parched-looking dermatitis appears on the side or top of the foot, if the paste has been too soft and has spread beyond bounds; a tendency to bleb formation over the toe pads where the time of application has been unduly prolonged; a minute vesicular eruption, in patches, each white-tipped, on the glazed baby epidermis under the same condition of excessive treatment; slight burning the first night in a few cases, practically always borne and seldom complained of, except by the very temperamental and neurotic; tenderness and irritation of the feet at least one or two days afterward; these are the worst sequelae to be expected under supervised application with proper regard for the contraindications of treatment which suggest themselves to any dermatologist.

Of this matter the patient's attitude is, of course, the best test. Of the 74 cases treated, only 5 refused to finish after beginning, 3 of them women. The business man growls at the discomfort and trouble, but his hope of relief and his interest in the novel and radical procedure outweigh temporary annoyance.

A soothing after-treatment such as cold cream or Pusey's liniment is welcome, not to mention the fact that not yet denuded areas, particularly those of patients with hyperkeratosis, rapidly acquire a board-like hardness with tendency to fissuring, unless they are kept soft by emollients. More or less specific anti-mycotic medication (if the term is allowed) within toleration of the fragile new skin was habitually employed afterward, since the speaker shares the opinion of some dermatologists that it is altogether possible that salicylic acid largely owes its curative tendencies in the mycoses to mechanical removal of the mycelium or spores. One-fourth to one-half of 1 per cent ammoniated mercury has often been used in the soothing preparation immediately after peeling. E. Woods Ruggles' iodin camphor lotion has been employed on subsidence of irritation from the salicylic paste, as well as 0.5 per cent chrysarobin in alcohol. The latter is undoubtedly very effective and seems to be better borne than the iodin lotion.

The success of the plan outlined, like much therapy in dermatology, depends largely on the patient, who in this particular instance is likely to cooperate best when he has already tried every other remedy without avail. The most explicit and detailed directions are not superfluous: he is instructed to apply the paste a quarter of an inch thick from heel to tips of toes; to smear the tops of the feet with vaseline or cold cream; to apply stout domestic to the soles or an old sock foot, drawing on a sock over all; told to renew the applications twice daily if necessary, plastering over any bald spot; if unable to carry out treatment continuously, to apply for successive nights. He is not to walk after putting it on. He is advised how to remove, by scraping, or by mixing with oil, since it will not wash off; apprised what to expect, a paper-white, dead-looking skin, and some irritation, which will rapidly pass off. He is taught care in removing desquamating skin, cutting it away with scissors, so that tearing will not occur at the borders still attached.

This method of attack is applicable in all of the three types of epidermomycoses usually described, the results, as might be expected, being especially pleasing in classical ringworm of the soles, with scaly,

advancing border, as well as in the so-called hyperkeratotic type, three of the latter being treated with most impressive and spectacular end results.

In the hands of the writer, recurrences in the vesicular types have by no means been unknown, but with three exceptions these were far milder than any previous attacks; recurrences have seemed most prone to occur in patches on the great toe and on the ball of the foot. But the experience of discouraging frequency in the first series of cases, of having a patient come back bitterly dissatisfied, complaining that he had not been benefited, etc., was during the last pleasantly rare.

On the hands, the treatment outlined has been used in only seven cases. Five of these were ringworm of the classical dry type, all verified microscopically. The discomfort from the paste is borne, but frankly complained of. And, owing to the anatomical peculiarities of the hand, the epidermis separates by a process of fragmentation, coming away far more slowly than the soles, even with treatment up to the limit of toleration.

Five days after treatment with salicylic paste. Patient, a business man, about his usual work. Desquamation of entire plantar surface complete at end of ten days.

OTHER CONSIDERATIONS

The diagnosis must be correct. This patently is no treatment for subacute eczema. Too, it cannot be too much emphasized that its employment is out of the question during a vesicular outbreak. The acute attack must be cared for until absolutely quiescent. This point cannot be too often repeated and stressed. A justly outraged and angry patient with a very sore foot will be the invariable result of forgetting it. Even in those cases which have new vesicles appearing from time to time, one slight attack overlapping another, I have learned to wait for opportunity.

George MacKee and John Remer, as well as others, have pointed out the fact that salicylic acid and the x-ray in large doses should not be used conjointly. This is well remembered here, for the x-ray often has been used in an effort to relieve this disorder, and cases which have received intensive treatment (one skin unit or more at the dose) within six months should not have this treatment applied.

In review, the removal of the horny covering of the soles for the purpose of more intimate attack against invading mycotic infection is practical.

The method, however, requires skillful supervision, and until further developed, should probably be left in the hands of the dermatologist.

DISCUSSION

Dr. J. M. King, Nashville, Tenn.—This is a matter that has given us all a great deal of concern. I think it was Mouktar who, about 1892, first worked out the question of ringworm of the toes and feet, and later, in 1908 and 1911, this subject was discussed by Whitfield of London and Sabouraud of Paris. They used salicylic acid, iodin, chrysarobin and benzoic acid.

Ringworm is a fungus allied to yeast, and for that reason benzoic acid might act as a good germicide, but I have not used it very often. I rely more upon salicylic acid, sulphur, chrysarobin and iodin.

I was impressed with Dr. Glaze's idea of shelling off the epidermis. The difficulty has been to get to the seat of the fungus, and anything that will enable us to do that certainly ought to be an aid in the cure of this disease.

Dr. Hutchins, of Atlanta, discussed this question in the *Archives of Dermatology and Syphilis* a few years ago and recommended the use of sulphur and salicylic acid strong enough to produce exfoliation in ointment form for use at night and in powder form in the day.

Later Dr. Williams, of the Skin and Cancer Hospital, New York, wrote an article along this line, advocating stronger applications of sulphur and salicylic acid. But none of these has recommended as radical an application of salicylic acid as Dr. Glaze.

We should give this plan of treatment a thorough test, since the condition is becoming more prevalent.

Dr. Lloyd W. Ketron, Baltimore, Md.—I would like to say a word with reference to the treatment of epidermomycosis, especially with the x-ray. I know it is generally considered danger-

ous to use the x-ray in conjunction with irritating ointments, but I have treated the disease in this way for seven or eight years and have never had a bad result. I use Whitfield's ointment usually, if there is not much acute inflammatory reaction, and all cases receive ¼ unit of x-ray once a week. I have never seen any irritation greater than that which may be obtained in using the salve alone. In the treatment of acne I use the x-ray also in conjunction with a sulphur preparation, usually Kummerfel's lotion, or 5 or 10 per cent salve. I would like to know whether anybody else does this. I have never had any signs of x-ray dermatitis in acne cases from this treatment.

Dr. J. W. Jones, Atlanta, Ga.—This subject to me is the most interesting one in dermatology, for the reason that about one-half of my practice in the spring and summer consists of epidermophytosis. If one picks out ten men on a street in Georgia, I believe seven of them will have it.

As to what Dr. Ketron says, I have used the x-ray a little. I find in treating the hands it is a very good thing and I get wonderful results; but not on the feet. Why, I do not know. I have adopted a measure something like that of Dr. Glaze for the feet. I use very strong salicylic acid, mostly in combination with Whitfield's ointment. At the same time I adopted Dr. Hutchins' old idea of peeling off the skin of the feet with a powder, but I must say my results were not very satisfactory. In practically all of them there was recurrence. I read the articles of Dr. Ruggles and Dr. White on iodin, and I tried it out thoroughly in the clinic and in private practice, but in my hands it did not work very well.

I would like to ask Dr. Glaze what he uses in the acute pustular stage of the dyshidrotic type. I am uncertain what to use before salicylic acid and Whitfield's ointment. If one uses strong salicylic in the acute stage one will cause irritation. Dr. Hutchins used to say that ammoniated mercury was a specific at that stage.

Dr. J. B. Shelmire, Dallas, Tex.—I wish to put on record the name of a man, not a physician, who was probably the first to treat this affection with the x-ray.

Twenty-five years ago this man came to my office with a typical dermatophytosis, at that time diagnosed pompholyx, of several years' duration, which had recurred from time to time. Two years afterward, while experimenting with x-ray, he found that it cleared up the attacks more quickly than any remedy he tried. He was then a resident of Texas, now of New York, Mr. E. H. R. Green.

When I was in Whitfield's Clinic this summer I was surprised to see him hesitate in the diagnosis of what was seemingly a typical case of acute dermatophytosis with numerous vesicles of the palms and interdigital spaces of four days' duration. He questioned the patient as to whether the trouble came suddenly, if she was handling irritating substances, etc. He said he never made a diagnosis of dermatophytosis unless he found the fungus, and he had not had an opportunity in this case to examine for the fungus. He also remarked that he was getting better results from chrysarobin than from Whitfield's ointment.

Dr. J. L. Kirby-Smith, Jacksonville, Fla.—In Florida, where everything grows luxuriantly, I think 90 per cent of the population have epidermomycosis or similar parasitic affections.

Some years ago a friend of mine was interested in preventing worms in cigars, and some one suggested the use of the x-ray to kill them. Some time after that I was treating a case of trichophytosis and found that the x-ray would stop the secretions. It retards the sweat glands. For good results in epidermomycoses of the hands and feet, use one-quarter dose of x-ray in conjunction with Whitfield's ointment, and in a few days the affection will be greatly improved. Of course they get reinfections, because most of them have diseased nails. I do not like to patronize the chiropodists, but I have a man next to me who grinds off all the diseased nails on the toes, and then I use Whitfield's ointment. I add to it fifteen drops of rectified turpentine, which seems to retard the fungus, and it sterilizes the skin. You must sterilize the feet and hands. Boil the socks, change the shoes, and have the nails ground down by a chiropodist. You must retard the perspiration.

Dr. Joseph A. Elliott, Charlotte, N. C.—This condition begins as a vesicular eruption, and in acute cases the vesicles soon become pustular. If you open the pustules and soak the feet in a strong potassium permanganate solution you get rid of the secondary infection. After the acute condition subsides I get good results with the x-ray and an anti-parasitic ointment.

Another phase of the treatment that I wish to stress is the mechanical removal of the organisms. We do this by clipping away all of the dead tissue possible. Dr. Glaze stresses removing this with a drug, but frequently we can remove a great portion of the dead tissue with forceps and scissors.

I have been interested in trying to find some drug that would inhibit the growth of the molds. I believe if we could get one it would go a long way toward preventing recurrences. If you examine the substance that comes from these vesicles you will find it to be highly alkaline. It seems to me for that reason it would be well to add acetic acid to the permanganate solution.

A year or two ago we made an attempt to classify this disease according to the infecting fungus and we cultured a large number. We found that the various fungi produced different lesions in different individuals. I think that this has been the experience of other men who have tried to classify these fungi.

Undoubtedly this condition is very prevalent. In this section of the country and farther South we find it especially prevalent around swimming pools, where the individual is constantly reinfecting himself. Unless we can get some substance

that will prevent the growth of these organisms, we will not get very far in the prevention or the cure.

Dr. J. Richard Allison, Columbia, S. C.—Treatment along mechanical lines is most important in these cases. I have become an expert chiropodist. I sit down with a magnifying glass and a scalpel and remove all of the callus down to the tender skin, where a honeycomb appearance of vesicles presents itself. These are all opened and drained. Then the patient is instructed to soak his feet in permanganate or bichlorid solution for some time. I believe with a scalpel one can do less damage to the healthy skin than by a strong preparation.

When I have a case where zinc ointment has been used, the first thing I do is to clean off the ointment.

Dr. C. Augustus Simpson, Washington, D. C.—I have tried both the x-ray and the Alpine lamp, and think there is no comparison in the results. The Alpine lamp treatment is not only keratolytic, but bactericidal. I cannot see that a quarter skin dose of x-ray will do anything more than stimulate epithelial growth. The atrophic action of such a dose is almost nil. In case after case my using the lamp on one foot and x-ray on the other I have demonstrated this to myself. If one carries the Alpine lamp to a heavy dose one gets complete exfoliation and it is uncomfortable for a few days, but one gets better results than with the x-ray.

Of course I use Whitfield's ointment. I cure very few of these patients.

Dr. C. Brooks Willmott, Louisville, Ky.—The reason we do not cure these cases is that they become reinfected. I have a pair of moccasins purchased in 1917, and both my wife and I have been repeatedly infected by wearing them.

I have had some ten or fifteen cases of ex-soldiers, some of whom had ringworm on the feet during the service. Others had not. Many cases that have come to my office have been wearing army shoes that had been worn by other soldiers. I have them burn these shoes and buy new ones. If they use Whitfield's ointment and other applications, and get all this infected skin off down to the true skin, they will have no further trouble.

Dr. Howard Fox, New York, N. Y.—Fungus infections of the skin are certainly not confined to the South. We all recognize the great prevalence of the various types. We recognize them clinically or microscopically, though in only a comparatively small number can we obtain cultures of the organisms.

As a therapeutic measure I have, like some of the other speakers, used the x-ray. In cases especially of the dyshidrotic type we see good results from this agent. It is somewhat surprising that such benefit should result, as the x-ray is not at all parasiticidal. The question of using the x-ray simultaneously with a strong irritant has been discussed. This is certainly contraindicated where large doses of x-ray are given as it increases the chance of an erythema with the possible subsequent production of telangiectasia. Where, however, the quantity is considerably below the erythema dose I feel that it is proper, especially upon regions like the feet, to combine the two methods of treatment.

Salicylic acid is one of our mainstays in this disease, the use of strong concentrations having been emphasized by Hutchins. I have never quite understood the reason for the addition of benzoic acid to the much used Whitfield's ointment.

Dr. L. K. McCafferty, New York, N. Y.—I have treated many cases of dermatophytosis with x-ray alone and practically all of them have cleared up. Occasionally a case or two will recur which respond readily to a few more x-ray treatments. Dr. MacKee always laid much stress upon the fact that stimulating ointments should not be used at the same time that the x-ray is used.

Dr. Glaze (closing).—Of a series of 345 cases of skin diseases of the feet 160 were not ringworm; 185 were diagnosed as ringworm; and 74 were treated by the method outlined. As Dr. Shelmire's discussion wisely emphasized, diagnosis by microscopical findings is sometimes impossible, but it is rare that careful culture work will not demonstrate a known pathological fungus in true cases.

The general trend of the discussion was toward specific treatment aimed at destruction *in situ* of the fungus. I would re-emphasize that the sole object of this paper was to suggest a method of "getting at" the fungus by removing the horny layer of the palms and soles. Salicylic acid has been offered and used in innumerable combinations in the treatment of the phytoses. Its use in a strong paste is here advocated as a means of preparing the way for specific treatment such as chrysarobin, 0.5 per cent solution in alcohol, weak iodin solution, etc. After the enemy has been deprived of his shield, he may be slain by weapons that were before ineffective.

The speaker agrees with Dr. Ketron that one-quarter skin unit doses of unfiltered x-ray may be used to advantage during acute attacks of the dysdirotic type of ringworm.

DIAGNOSTIC ERRORS*

By C. W. DOWDEN, M.D.,
Louisville, Ky.

What is responsible for diagnostic errors, and what can be done to prevent them? I have very carefully reviewed several hundred records and from these selected the histories of those cases in

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which the symptoms warranted a complete investigation of the gastro-intestinal tract. Ninety-six were found in which the patient had not been benefited by previous medical treatment or surgery, in some instances due to an improper diagnosis and in others due to overlooking the associated conditions, although one diagnosis had been correct. With the many refinements of both medical and surgical diagnosis that have come to us in the past decade, one would expect fewer diagnostic errors than ever before. Naturally, physicians who use intelligently the various diagnostic procedures in connection with a carefully taken history and a painstaking physical examination, will make fewer errors than others. It must be recognized, however, in many instances that not only the highly technical diagnostic procedures, but often the simpler ones as well, act as two-edged swords, of inestimable value when properly performed and in the hands of skilled physicians, but accentuating wrong impressions in the minds of the unskilled or careless. Many useless surgical operations are the result of a poorly made or an improperly interpreted x-ray examination. The same is equally true of various laboratory procedures. Surely, when diagnostic accuracy depends so much upon the laboratory and the x-ray, some compulsory standard should be required for those conducting them. Modern diagnostic methods have found a greater field of usefulness in proving the absence of disease than its presence. Thus they frequently prevent needless operations or burdensome dietetic restrictions and medication, *usque ad nauseam*.

You will frequently hear from capable clinicians: "If I had to be guided by one thing alone, I would prefer the information obtained from a good history to that obtained from any other examination." Such statements can come only from those unskilled in the use of the various diagnostic methods or they are ignorant of the results which they supply. Furthermore, it is this belief put into practice that is probably responsible for more diagnostic errors than any single thing. Certainly if one expects to avoid the numerous diagnostic pitfalls and fulfill his obligation to his patient, he must avail himself of every possible procedure that will lead to a proper diagnostic conclusion. This common practice of making a diagnosis from the history and physical examination alone, coupled with the fact that modern surgery holds little or no terror for most patients, is largely responsible for the many scarred abdomens that we see in our daily practice; too frequently with nothing but the scars to indicate that an operation has been performed. Whereas a decade ago the great difficulty was in inducing patients to submit to operations, today the great difficulty is in convincing them that surgery is not indicated.

Of the ninety-six cases under consideration in which the diagnosis was wrong, or at least the patient had not been benefited by treatment, thirty-two had had some surgical operations performed. One had had five operations, was quite proud of it, and was seeking a sixth; one had had four operations; three had had three each; seven had had two each; and twenty had had a single operation. Twenty-four of the thirty-two had had their appendices removed.

The following is not an unusual history. The patient complains of vague digestive symptoms, possibly nausea or vomiting at times, and the physical examination reveals some tenderness over the right lower quadrant. Surgery is advised and the appendix is removed. In the majority of instances it probably shows some abnormality. The patient returns in a few months or a year with the same symptoms and a healthy gall bladder is sacrificed. In another year matters have grown worse and examination of the pelvic organs shows some malposition of the uterus and possibly a slight perineal injury, therefore a ventral fixation is done, the perineum is repaired, and probably at the same time some hemorrhoids are removed. The patient drags along for another year or so, going from bad to worse, and finally as a *dernier ressort* the coccyx is removed, since there has been a slight shift of symptoms to the back. Is it any wonder that in another year the

patient is more dead than alive, and out of tune with the whole world in general, and doctors in particular? At this time she consults a neurologist, who finds her belonging to one of the hysteria group and with an old tuberculous process in the lungs. There had never at any time been any organic basis for the abdominal pain.

Such extreme cases are probably rare, although they do occur occasionally in every practice. Frequently, after the appendix has been removed and the symptoms persist, careful examination reveals the presence of active tuberculosis. Again hyperthyroidism or some other disturbance of the glands of internal secretion is found to account for the abdominal symptoms. Neurologists very often in such cases will find typical stigmata of hysteria. Not infrequently symptoms are rather accurately feigned and operations sought. The patient believes cancer to be present since some member of the family has been so affected. Very often the first evidence of a failing myocardium is indicated by nausea, distention, abdominal distress and other symptoms referable both to the stomach and the intestinal tract. It is well to remember, furthermore, that some of the achylics who report on account of some digestive disturbance later develop pernicious anemia. Arteriosclerosis frequently accounts for many attacks of indigestion, fullness, flatulence, irregular and indefinite pain. Certainly in this condition a careful study of the gastro-intestinal tract will fail to reveal evidence of any inherent pathology. Reflex pains from the kidney, ureter, bladder, prostate, seminal vesicles and pelvic organs are well known. Many young girls with an anxiety hysteria, belonging purely to the field of neurology and psychiatry, report to the internist for relief of abdominal symptoms, and not infrequently are subjected to operation. Such problems bear most heavily on medical men, and especially those interested in gastro-enterology, for in this domain many or most of the symptoms are reflected. In practically every case the symptoms are such that they might easily belong to an organic lesion. Good surgeons insist upon positive evidence of disease before operating, but unfortunately there are many who will operate upon the mere suggestion of disease. I do not believe that a surgical operation is ever harmless and in the absence of demonstrable pathology the patient is usually left in a worse condition than before. Errors in diagnosis of abdominal lesions that are surgical are usually not serious. For instance, if duodenal ulcer is diagnosed and gall stones are found on operation the patient is benefited from the operation just the same. The same of course is true of other abdominal lesions. It must be kept in mind, however, that very often two separate lesions are found in the same individual, such as a chronic appendicitis associated with lesions of the stomach or gall bladder. Most surgeons explore the entire abdominal cavity once it is opened, but that all do not is evidenced by the number of patients who have had the appendix removed and a diseased gall bladder or a duodenal ulcer has been left. It is always well to remember, or rather never safe to forget, that although organic disease is present and admittedly surgical, the underlying or associated functional disease is often responsible for the patient's symptoms and will frequently continue to operate even if the organic disease is removed. Conversely, correction of the functional disease will often relieve the patient of his symptoms regardless of the presence of organic disease. This applies particularly to gastric or duodenal ulcer associated with a high degree of spasm, also to gall stones, appendicitis, etc.

It is at times impossible to accurately differentiate between gall bladder disease and ulcer of the pylorus or duodenum. This, however, should not occur often if the various diagnostic aids are employed. Given a patient with symptoms referable to the epigastrium and consisting of burning, sourness, gnawing, etc., occurring from two to four hours after eating and relieved by food or alkalis, it becomes at once the duty of the physician to prove not so much that ulcer is present as to prove if possible that it is not pres-

ent. In a large percentage of such cases the laboratory and x-ray corroborate this opinion. Many cases, however, do not present such clear-cut histories. There is very often such a mixture of subjective and objective symptoms that one's diagnostic acumen is sorely taxed. The patient may have all or at least most of the above symptoms, and at the same time slight jaundice and an enlarged tender liver, frequent colicky pains and the x-ray examination showing faint shadows in the gall bladder region as well as definite filling defects in the duodenum, even after the employment of atropin or belladonna for days. At this point, some guessing is usually indulged in, with reasoning along such lines. "Gall bladder disease is considerably more frequent than ulcer, and if the patient is over 'forty years of age, is fat and belches gas' and has had typhoid fever the evidence is usually in favor of gall bladder disease." The following case is illustrative:

Case 114.—M. was 44 years old. He had had typhoid fever severely in 1883 and again in 1897. For the preceding six weeks severe cramp-like pains in the epigastrium had been coming on very suddenly and radiating along the right costal border. At first, food relieved him for two hours, but later no food relation was apparent and extreme distention was the predominating symptom. Physical examination showed marked jaundice. Positive tenderness was plus four in the epigastrium and gall bladder area. Free hydrochloric acid was 68, total acidity 94, and the occult blood test negative. He had 80 per cent hemoglobin, red blood cells 6,585,000, leucocytes 8111, and polymorphonuclears 68 per cent. Under the x-ray vigorous peristalsis was demonstrated and the duodenal bulb failed to fill. The pylorus was fixed. There was a large six-hour residue and a single large gall stone shadow was clearly visualized. The diagnosis was cholecystitis with stones and adhesions.

The operation revealed a large duodenal ulcer without evidence of gall bladder disease or stones. The shadow mistaken for a gall stone was a calcified gland. Again reviewing the history, it will be noted that there was definite relief from food for two hours. There was epigastric tenderness and hyperacidity, and there was polycythemia, all suggesting the possibility at least of ulcer, regardless of the x-ray findings.

Such errors as this will continue to occur, but at the same time they indicate that a very careful analysis of all symptoms and findings is necessary.

There would seem, however, to be no valid excuse for mistaking the secondary anemia due to carcinoma of the stomach for pernicious anemia. With the employment of the various aids at hand, such mistakes should not occur. I have, however, not long since, seen a patient with inoperable carcinoma of the stomach (and who died ten days later), who had been under treatment for ten weeks for pernicious anemia by a capable internist.

I am of the opinion that a careful x-ray examination affords more evidence of a chronic appendicitis than has been supposed. I am furthermore of the opinion that few errors are made in the diagnosis of ulcer when ulcer is present. Such pathology makes itself known in a manner that is usually unmistakable. Most of the errors consist of diagnosing ulcer when it is not present.

Spasticity should rarely be mistaken for malignancy, although this has happened in my own experience.

A patient with a large filling defect in the colon which could not be filled with barium on prolonged manipulation and which persisted for many days in spite of anti-spasmodics to full effect, and which was associated with marked anemia and loss of weight, with subjective symptoms entirely consistent, compelled, in my opinion, a diagnosis of malignancy. There was, however, sufficient doubt to ask the opinion of a proctologist. It took six months' treatment in a hospital for him to convince me that I was wrong, and that the condition was due to spasticity.

My experience has taught me that no diagnostic investigation is complete without a Wassermann test of the blood. Frequently, furthermore, when the blood is negative, a positive spinal fluid will offer a proper solution of the diagnostic difficulty. It is surprising how frequently syphilis will simulate ulcer of the duodenum. There is no reason, of course, why syphilis should not have the same incidence in individuals with ulcers as in those without, and I am positive that in at least two cases ulcer was present at the same time. I do not believe that such circumscribed lesions are syphilitic in character, since syphilis of the stomach presents quite a different picture, resembling usually carcinoma of the stomach. If ulcer is present, the patient is not benefited by the anti-syphilitic treatment. In

two cases in which the gastric symptoms persisted after two years of specific treatment, relief was obtained promptly in a few days on proper dietetic and medical treatment for ulcer. On the other hand, if ulcer is not present the patient will of course obtain no relief whatever from his symptoms until anti-syphilitic treatment is instituted. It would seem from the following that no individual is exempt.

A woman, aged 62, very pious and of a religious turn, and the wife of a minister, had been a chronic intestinal invalid for a great many years. She had been examined by many physicians without obtaining relief. An examination of the blood showed the Wassermann test to be four plus on two different occasions.

Again a girl of seven, of normal healthy parentage, with obscure symptoms but a rather marked anemia, was not benefited until after the institution of anti-syphilitic treatment, following the discovery of a positive four plus blood Wassermann. Such cases certainly indicate the necessity of this procedure as a routine.

I am more and more of the opinion each day that an apparatus for determining the basal metabolic rate should be a part of each gastro-enterologist's armamentarium. It is quite true that the endocrine system is not included in the domain of the gastro-enterologist, but it must be recognized that not infrequently, symptoms depending upon abnormal function of this system, closely simulate those depending upon gastro-intestinal pathology. Many diagnoses would be revised if one knew that the patient had a metabolic rate of plus thirty or a minus twenty.

Generally speaking, it would seem that little difficulty should attend the diagnosis of malignancy of the gastro-intestinal tract, particularly if all the diagnostic procedures, and especially the x-ray, were employed.

I have in my series one case, however, that had one year previously had the gall bladder, containing several hundred stones, removed. Her symptoms persisted as before and repeated examinations left the impression that there were dense adhesions about the pylorus. After all usual methods had failed to relieve her of her pain she submitted to another operation, at which time a carcinoma of the hepatic flexure of the colon was discovered with marked glandular metastasis. There was absolutely no obstruction, neither was there loss of weight or anemia. The question naturally arises whether or not this may not have been present when the gall bladder was removed, since the symptoms persisted and were of the same character and severity.

It seems to be a rather general impression among patients, and unfortunately with a few physicians also, that after an operation is once performed the patient will be entirely well and can resume his usual habits of life. This is particularly true in connection with surgery of the stomach.

Fifteen months after removal of the gall bladder, excision of a duodenal ulcer and removal of the appendix, a patient reported for relief of rather marked abdominal symptoms suggesting obstruction. This indeed was the case. At four and a half hours after the ingestion of barium at least 90 per cent of the barium remained in the stomach. The natural presumption was that this was an organic obstruction due to postoperative adhesions. With proper dietetic measures, however, and anti-spasmodics to full effect the residue was reduced to one-half in seven days. In one month there remained only 20 per cent of the barium at the end of four and one-half hours. It is reasonable to assume that by continuing this line of treatment the patient will be entirely relieved. Evidently the obstruction was not organic and the spasm depended upon the fact that he had received no postoperative instructions as to the care of his diet. This is frequently the case.

Surgical statistics are often unreliable since the patient seems to feel that if he is not improved he must return to his medical advisor for relief. Surgeons see comparatively few of their cases after operation, whereas the medical men see many.

Cirrhosis of the liver frequently offers many diagnostic difficulties. Particularly is this true where the condition is associated with hematemesis. The history of alcoholism, however, and enlargement of the spleen, with usually an absence of the subjective symptoms of ulcer, will suffice to make the proper diagnosis.

Two cases presenting gastro-intestinal symptoms had tuberculous spondylitis. Both had been treated for months for vague gastro-intestinal disorders.

The mere diagnosis of cholecystitis is not always sufficient to indicate the true condition. One case had been under treatment for cholecystitis for more than a

year and was completely relieved of her infection as well as her subjective symptoms after the injection of grams 0.6 neoarsphenamin following the discovery of Lamblia intestinalis in the bile obtained by the Lyon method. This condition resisted all other treatment, including a ten-hour transduodenal lavage with 4 per cent sodium suphate solution.*

Pure typhoid cultures have been recovered three times in the bile and in one, strange to say, no history of a typhoid infection was obtainable.

Aneurysm of the abdominal aorta accounted for one case in which the symptoms simulated very closely gall bladder disease.

In only two cases did I feel justified in attributing the gastric symptoms to oral sepsis. In both these cases pyorrhea was extreme and the tonsils also were badly diseased. I am of the opinion that symptoms occur through swallowing septic material rather than by metastasis through the bloodstream.

And what role does spasticity play in the production of symptoms referable to the gastro-intestinal tract? So intimately is this associated with the workings of the vegetative nervous system, and this in turn so dependent upon the endocrine system, that much of real value has come to us in the past few years, through neurology and psychiatry to enlighten us concerning many functional disorders. With the tremendous nervous strain incident to the progress of the American people in all lines of endeavor the past few years, it becomes more and more important to consider personality and give more time to individual study of psychology and place less trust in physical examination. Until a few years ago I was only one of many who did not believe in hysteria, neurasthenia, psychoneurosis, etc., as a basis for abdominal symptoms. Looking back over my work for twenty years, I can see many errors of diagnosis with resulting disaster that I would like to forget. I believe many physicians have the same idea today.†

Finally, it would seem that the chief causes of diagnostic errors are:

(1) The rather common idea put into practice that "if I had to be guided by one or the other alone, I would prefer the information obtained from a good history to that obtained from any other examination."

(2) The lessened dangers of modern surgery.

(3) Failure properly to evaluate symptoms depending upon the nervous system for their origin (including particularly the working of the sympathetic and extended vagus systems, and the role of spasticity).

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*Five months after this report was made this patient returned for further treatment, and on examination the bile was found to be teeming once more with Lamblia intestinalis. Six intravenous injections of 0.6 G. neo-arsphenamin had no effect whatever on the condition, and apparently they increased in number.

†Contributions by Alvarez, Jelliffe, Goodhart, Kauffman, Eppinger and Hess and others have been very enlightening, and assist very materially in explaining many hitherto puzzling symptoms.

DISCUSSION

Dr. F. M. Durham, Columbia, S. C.—One can hardly do too much in order to arrive at a diagnosis. When we take a gastric analysis and make just one proctoscopic examination, just one sole examination of any kind, we have not done our duty to the patient. I want to report one or two cases where modern surgery has caused a good deal of trouble simply because only one examination was made. I saw a patient who was a very nervous woman, who had been operated upon sixteen times and was still suffering. She was as proud of the sixteen scars on her abdomen, which made it look like a crazy quilt, as we would have been to discover something really important in medicine. One of my greatest difficulties is to try to keep some people from being operated upon.

A patient of mine who had suffered with gastritis and had been advised to live on a simple diet, enjoyed going to his club at night and did not stick to his diet and consequently did not improve. He fell into the hands of a modern surgeon, had his appendix taken out and improved for two months because he remained in bed and was on proper diet.

I have another patient who was in the Spanish-American War, went to the Philippine Islands and has suffered ever since with diarrhea. He had had two operations for hemorrhoids and an appendectomy. He had never been proctoscoped and yet he had amebic dysen-

tery. I think the majority of errors in diagnosis are made not by ignorance on the physician's part, but through laziness. If we would study our cases ourselves instead of allowing nurses or assistants to take the histories, we should get along very much better.

Dr. C. L. Minor, Asheville, N. C.—The best history is of little value if the physical examination and work along other lines is slipshod. A diagnosis is a synthesis from a careful analysis of all the facts that observations yield. Your first observation is a careful, intelligent history, not the mere filling out the blank spaces in a printed form, but a logical reasoned inquisition into the past life and conditions and the genesis of the present complaint. Physical examination must be carefully made, yet it is too often a mere routine. Inspection is very important if it is properly done and should be most carefully carried out. An x-ray is valuable, but is by no means an essential part of the examination, as so many now seem to think. In the easy case the diagnosis may be clear from the history. In the difficult case it may be uncertain after all the examinations. You may need from a week to a month to study the patient, arranging his exercise, his rest, mode of living and diet. I would emphasize the necessity of constant reading to keep in touch with the latest methods.

It is important to take the patient's history yourself. I have a splendid assistant who takes a detailed history, but I get an impression in my own mind that he cannot possibly give me by taking the history myself. The primary thing is to observe clearly and closely and from these observations to draw rational conclusions.

Dr. Seale Harris, Birmingham, Ala.—For several years, at the end of six months or a year, I have written my patients to ask what symptoms they have had since our last examination and whether or not they have been benefited. When we have made the most superficial examinations we are inclined to think we have made few mistakes, but we find that the more careful examinations we make the more errors we will find that we might have passed over.

I have made several mistakes in the diagnosis of ulcer, some of those cases later having been found to be due to gall stones. I have seen several cases of gall stones in which there was absence of symptoms for one or two hours after eating, and pain was relieved by eating.

Some years ago Dr. Simpson and I looked over our ulcer cases and found that more than 50 per cent had been operated upon for appendicitis, and undoubtedly the history of the large majority showed that they had ulcer from the beginning. I am almost beginning to believe that there is no such animal as chronic appendicitis.

Many mistakes have been made after the abdomen was opened. I recently asked Dr. Mayo if he had any hope to give the inoperable cases. He said: "Doctor, there is a hope of mistaken diagnosis. We have operated upon a number of cases where we found a typical carcinoma of the stomach, as we believed, and yet the patient lived years afterward." I have seen two cases in which a diagnosis of carcinoma of the pancreas had been made. A surgical gall bladder drainage was done, the symptoms were relieved and the patients have been well, one of them for over two years. We must consider the case from every viewpoint and study it for several weeks often before we can give an accurate diagnosis.

Dr. W. T. Vaughan, Richmond, Va.—The patient often has certain intimate facts that he wishes to tell his doctor. If the history is taken by an assistant such facts are not always brought out. Physical examination should be done thoroughly and routinely in every case. We must guard against the tendency to make it purely mechanical. Thinking about something else while making a mechanical examination, we may elicit all the signs and yet not recognize their presence.

In making an examination there is a tendency among all of us to neglect the use of the most important sense of all, the sense of sight. We are in a hurry to get on with the physical findings and do not use our eyes. Some of us scarcely see the patient, either as a whole or in part. We feel for an absent abdominal mass and fail to see self evident peristalsis. We are all in too much of a hurry to emulate the Great Physician and practice the laying on of hands.

CHRONIC DUODENAL STASIS*

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The development of the x-ray has opened up new vistas in our knowledge of gastro-intestinal disease. One of the conditions which could not, and still can not, be recognized clinically, except by the x-ray, is that which I am about to consider, variously termed chronic duodenal dilatation, duodenal stasis and duodenal obstruction. I believe the term duodenal stasis is the most comprehensive.

For many years the literature on this subject was sparse, as dilated duodenum was found only occasionally at autopsy, or still more rarely in the course of an abdominal operation. During the last 10 years it has attracted more and more attention, but still not so much as it deserves, for two reasons: First, it is much more common than is generally supposed, and, secondly, as I hope to show, it is im-

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portant clinically, as there are practically always distressing symptoms. One may have ulcers without symptoms, silent gall stones, etc., but it is rare that duodenal stasis occurs without making itself very manifest, so that it is deserving of consideration as a clinical entity.

For this reason, and also because less is generally known of this condition than of most other gastro-intestinal disturbances, I shall analyze from the clinical standpoint a group of 25 patients. No attempt is made to review the literature as this is in the nature of a personal study of clinical manifestations.

To show the frequency of duodenal stasis it may be stated that these 25 cases have all been collected in the last two years, as previous to that time I did not have the condition cross-indexed and could not review the findings in patients previously seen.

In this classification I have included only those cases where there was definite obstruction, usually with dilatation, well down in the duodenum, and do not include duodenal ulcer with obstruction in or near the cap. Of the 25 patients, 14 were males and 11 females. It would not appear that there is much difference of incidence in the sexes although we might expect the opposite, a preponderance of females.

One fact stands out. This condition is one of young adult life and middle age. The youngest patient was 22 and the oldest 60, with an average of 36 years. The older patients all gave a history of long duration, usually 10 years or longer. The tendency is to chronicity. There would not seem to be any characteristic course, as, in some, symptoms were continuous, and, in others, intermittent. However, the majority showed a tendency to periodicity of symptoms as in duodenal ulcer.

The manifestations of duodenal stasis are such that cases may be clinically placed in four groups or types. Type I includes those in which the mechanical factor appears to predominate, and the symptoms are of the duodenal ulcer type. In Type II, toxic symptoms are the most marked. Type III comprises those who show a mixture of the mechanical with the toxic, and in Type IV are placed the occasional atypical cases. The symptoms of the various types will be elaborated on further. In this series are nine of Type I, two of Type II, eight of Type III, and six of Type IV. Therefore, 80 per cent showed definite evidence of either a duodenal ulcer syndrome or a toxic picture which is different from a lower bowel absorption or a mixture of the two.

The most marked complaint in Group I is pain. Then there are fullness and often nausea and vomiting. The pain may be a typical hunger pain indistinguishable from that of duodenal ulcer, and in common with that disease, may be of a burning, gnawing, colicky or cramp-like character. Many of the patients, however, complain of pain soon after meals. The explanation for this I believe to consist in the fact that the pylorus is often insufficient and emptying of large amounts from the stomach into the duodenum occurs almost immediately upon eating with resultant distention of the obstructed duodenum.

The mechanical obstruction is further reflected symptomatically by a marked sensation of fullness and bloating. The sense of pressure may be referred to the cardiac region.

A rather high degree of obstruction seems to be necessary before there is vomiting, although acid regurgitation is very common. These symptoms appear, too, to be largely dependent upon a personal peculiarity of the patient. Occasionally high degrees of duodenal and gastric retention are not accompanied by vomiting, while in others slight disturbance seems sufficient to produce it. Loss of appetite and satiety are most frequent.

In the patients whom I have classed in Type II, while the mechanical symptoms of fullness, etc., are present, the pain is not a marked feature of the picture but is overshadowed by toxic and neurotic symptoms. Thus we encounter neurasthenia, psychasthenia, the effort syndrome, and hypochondriasis, manifested by headache, vertigo, fatigability, and palpitation of the heart. One of the outstanding features is an exaggerated fear of eating.

There can be little doubt that the source of the toxins which play a part in producing neurotic symptoms is from the duodenal mucosa and differs only quantitatively from the poisons produced in acute intestinal obstruction. There is no more disturbance of function of the lower bowel than in any other class of gastro-intestinal disease. Indican was found only in five of the cases, or 20 per cent.

A mixture of the symptoms found in Type I and II is found in Type III, while in Type IV are a few atypical cases showing perhaps some of the characteristics of some of the other types, but not definitely enough to classify.

Examination of the stomach contents in these 25 patients showed varying degrees of acidity, but there was a greater tendency to hyper- than to sub-acidity.

Another finding is a not infrequent mild leucocytosis, varying from 10,000 to 12,000. The leucocytes were found thus slightly increased sufficiently often to arouse some wonder as to the meaning.

This series was further divided rather arbitrarily into four grades reflecting the severity of symptoms rather more than the actual degree of obstruction. Thus, there were 10 of mild symptoms, plus 1; eight, plus 2; six, plus 3, and three, plus 4.

Diagnosis is absolutely impossible without the x-ray. As a permanent record or for study in detail, films may be utilized, but the fluoroscopic examination suffices in the majority of cases and is the more valuable of the two.

All these patients showed stasis. In most there was a varying degree of dilatation from a slight increase to a size of three inches in diameter. In the majority the site of the obstruction could be plainly seen, and was most often at or near the junction of the descending loop of the duodenum with the horizontal portion. In others it was about one-third the distance across the horizontal loop, about at the crossing of the mesenteric vessels.

Reversed peristalsis is frequent and this is pathognomonic. Other observations are open pylorus, gastric hyperperistalsis, and six-hour retention in either the stomach or duodenum, or both. The stomach was at times hypertonic, but in other cases, hypotonic and dilated. In certain patients the transverse colon was markedly ptotic and that this may have a direct bearing on the stasis will be shown later in considering the etiology and pathology.

To appreciate the indications for treatment of duodenal stasis it is necessary to know as much as possible of the pathology and etiology, both in the abstract and as applied to each individual. Space will not permit a discussion of the anatomy and embryologic development of the duodenum or an elaboration of all the details of pathology. This is amply covered by a wonderfully complete article by Hugh Crouse, of El Paso, Texas, in the *Archives of Surgery*, Nov., 1920, and from which I shall quote freely.

Obstruction of the duodenum may be caused by a number of factors: kinks, adhesions, either congenital or acquired, or pressure from without, in addition to the rarer intrinsic lesions of a low duodenal ulcer, diverticulum, or an impacted gall stone, which do not come properly under this category.

There are three types of duodenum, an absolute normal, which is not so apt to become obstructed except by outside pressure, being shaped like the letter C. It may almost be considered as being composed of only two parts, the ascending curve or cap and all the rest making a general undulating curve without sharp turns. The second type is V-shaped, consisting of three distinct parts, the cap, a descending more or less straight loop, and the third part, ascending much higher than in the C-type, with a fairly acute angle between the two loops. Lastly, there is the U-type, of four parts, short ascending, long descending, forming a right angle with a horizontal, which forms another right angle to join a slight vertical fourth part. It is evident that anything that may accentuate the angles of the V and U duodenum or the duodeno-jejunal angle at the ligament of Treitz can produce stasis.

Some possible etiological factors are: (1) Developmental or acquired adhesions, most commonly those that run from the transverse colon or a displaced hepatic

flexure to the under border of the liver, gall bladder, pylorus, or duodenum. These may act by either being directly attached to the duodenum and producing kinks, or by passing across it and by tension compressing the duodenum.

(2) A combination of ptosis of the transverse colon and a short mesentery of the small bowel can cause the superior mesenteric vessels to compress the duodenum. In one of my patients who came to autopsy the groove caused by the vessels in the anterior wall of the duodenum was extremely deep and persistent. So also, such ptosis can accentuate the angles of the V and U duodenum or the angle of the duodeno-jejunal junction or can approximate the two folds where the duodenum emerges from behind the peritoneum.

(3) The duodeno-jejunal angle can also be accentuated by a type of jejunum which drops straight down toward the pelvis instead of running to the left posterior abdomen.

(4) Pressure by abnormal conditions of the head of the pancreas can produce obstruction. I have not recognized any of these in my series.

(5) It is not impossible for a sort of atonic ileus to occur, due to disturbed innervation of the duodenum or as a constriction formed by spastic circular fibers.

Crouse mentions that he has observed 16 cases with symptoms simulating chronic appendicitis, in which operation had been performed without relief. In this connection I might state that many of my cases had real appendicitis, often with right iliac adhesions, so that I have wondered whether the possible traction and dragging of an adherent omentum might not be a factor in producing duodenal stasis.

The treatment of chronic duodenal stasis may be palliative or surgical. The palliative treatment includes medical, symptomatic treatment and mechanical. The etiology of the condition is so varied that the treatment must of necessity be varied to meet individual requirements.

The patients with ptosis should have the foot of the bed elevated, rest, be fed abundantly, and wear a suitable support. Since hyperacidity is such a common accompaniment, alkalis afford considerable relief and can be given in the form of the usual powder, of which every gastro-enterologist has his favorite combination. It is best given 15 minutes after meals and repeated in an hour.

Hot water with a pinch of soda on awakening seems to wash out the duodenal sac. A more direct method is duodenal lavage with the duodenal tube.

The curative method of treatment must usually be surgical. It should aim at the removal of the causative factor. If this consists of bands or adhesions or a diseased gall bladder, the relief is not accompanied by a great risk. However, for a huge dilated duodenum with marked obstruction, and particularly when it is due to gastro-mesenteric ileus, a duodeno-jejunostomy is the only way of effecting a cure. By joining the dilated second part of the duodenum to the jejunum the sac is drained and obstruction removed. It is generally conceded that gastro-jejunostomy is of no avail. I made the mistake of trying it in one desperate case because it could be done with more ease and safety. This operation will enable the stomach to empty but does not drain the dilated duodenum, and so the latter neither regains its normal tone nor does the formation of toxins cease.

Only eight of my 25 cases have been operated upon; and in some of them nothing was done directly for the duodenal condition. I feel that one should consider well before advising any operation, and especially a fairly formidable one, like duodeno-jejunostomy. On the one side of the balance we should place: (1) the risk the patient runs in losing his life if the malady is uncorrected; (2) the amount of discomfort the trouble is causing, and (3) how much chance there is of the palliative treatment's helping him. On the other side of the scales we should put: (1) What is the risk to life of the operation, and (2) what percentage of cures can it give. This side of the balance must far outweigh the first before we are justified in operating.

In conclusion, I shall give abstracts from several histories to bring out some of the points.

Mrs. H. M. T., age 39, had been ill for a year, complaining of attacks of distress and gas in the upper abdomen. She was never completely free from trouble. There were attacks of colic, soreness in the right shoulder blade region, and a burning, gnawing sensation between the shoulders. Toxic symptoms were marked, consisting of easy fatigue, exhaustion, general malaise, and migraine attacks.

Tenderness was most marked over the gall bladder region. Otherwise the examination was negative. There was a moderate secondary anemia. X-ray examination made elsewhere showed no abnormality of the duodenum. There was a marked exaggeration of gastric peristalsis. The transverse colon was markedly ptotic and there was a distinct tenderness over the gall bladder region. Diagnosis was made of cholecystitis, visceroptosis, ovarian pathology, vagotonia, and secondary anemia.

She was operated upon a little later elsewhere. The gall bladder was found to be normal. A cystic ovary was removed on the right side and also a normal appendix removed. The uterus was retroverted and a Coffey suspension operation was performed. There were a few cobweblike adhesions resembling a Jackson's membrane in the upper abdomen running from the colon across to the gall bladder and the under surface of the liver. The duodenum was considerably dilated without any apparent cause. Nothing was done for this condition.

She has not been better since that time and is at present in another city. I have no doubt that the dilatation of the duodenum produced by the membrane, for which nothing was done, plays a large part in the continuance of her symptoms.

M. W., age 45, complained periodically for a number of years of symptoms resembling duodenal ulcer. There was pain, tending to become more marked several hours after meals, accompanied by a sensation of fullness and pressure soon after eating. Otherwise, symptoms and physical examination, as well as laboratory tests, were negative.

Fluoroscopic examination showed the stomach to be slightly ptotic, and the transverse colon markedly ptotic. There was slight hyperperistalsis and rather rapid emptying. The duodenal cap was large and regular. There was a definite obstruction about the junction of the second and third parts of the duodenum, with occasional reverse peristalsis. The duodenum was considerably dilated. The symptoms were so distressing that he consented to an operation, during which we found as the only cause for his disturbance marked adhesions in the upper right abdomen, for which no adequate explanation could be found. The gall bladder was normal and there was no evidence of gastric or duodenal ulcer. Adhesions were divided and their constricting effects could be seen as the duodenum unfolded and assumed a more gradual curve. Since the operation his relief has been complete.

Mr. S. C., age 47, gave a history of periodic disturbance for 20 years. His symptoms were acid stomach with regurgitation and pain in the upper epigastrium tending to come anywhere from one to four hours after meals. He was relieved by alkalis. There was a marked sensation of pressure in the upper abdomen which would at times wake him at night. His gastric contents showed hyperacidity, and hypersecretion; free hydrochloric acid was 72, and total acidity, 80. Occult blood was strongly positive and there was a leucocytosis of 15,400 on first examination. The count dropped on the second examination to 7,700.

Fluoroscopic examination showed a definite moderate delay to liquid at the cardia. The stomach was large and slightly atonic. There was a marked pylorospasm, which necessitated the administration of belladonna and a subsequent examination. At the second examination a perfectly normal cap was obtained with rapid emptying from the stomach. There was a very definite obstruction between the second and third parts of the duodenum, with a moderate amount of dilatation of the proximal duodenum. Reversed peristalsis was present.

He improved clinically and was kept on medical treatment for over a year. Later, however, upon again feeling worse, he was again examined with the fluoroscope, which showed the same dilated duodenum, with slight obstruction at the beginning of the third part and an eighth gastric residue after six hours.

He was operated upon elsewhere. A small duodenal ulcer was found in the first part of the duodenum and there were extensive omental adhesions in the lower abdomen from an unknown source, which must have been the etiologic factor in making drag upon the stomach and the duodenum. Since the operation he feels perfectly well.

R. A. H., age 42, was seen April 9, 1923. He had never been very strong and had been subject to what he termed bilious attacks. He had a floating kidney for years. Recently he had had attacks of cramp-like pains in the epigastrium accompanied by soreness and toxic symptoms which he called biliousness.

His color was sallow, with rather heavy circles under his eyes. He was thin and of ptotic build. The right kidney was ptosed to the third degree. There was somewhat more rigidity of the upper right rectus than the left, but otherwise the examination was negative. On a number of examinations the leucocyte count varied from 10,600 to 12,700. On fluoroscopic examination the stomach was found to be left-sided, drain trap, and dropped to the pelvis. It emptied rather rapidly. The cap was large and very slightly irregular. The second part of the duodenum was markedly dilated with considerable stasis. At the end of six hours, however, it had emptied itself. Subsequent examinations have shown that there is still the same marked dilatation of the second and beginning of the third parts of the duodenum, the cause of which has not been definitely found. This patient can be kept reasonably comfortable by diet and alkalis so that it has not been

considered wise to advise operation unless conditions change.

The last case which I shall present is the most interesting of all and is the worst one that I have encountered. W. W. was first seen November, 1913, at the age of 31. At that time he had been ill for three and one-half years, complaining of a great feeling of fullness after eating, with pressure about the heart. He complained of palpitation of the heart, shortness of breath, and was relieved by belching. He had an absolute fear of eating. Radiographic examination at that time showed a hypotonic stomach with a constriction about the third part of the duodenum, the proximal part of which was markedly dilated and showed residue some hours afterward.

He was then lost sight of until February, 1922. At that time he had become a walking skeleton, being over six feet tall and weighing 90.5 pounds. He had been partially starved for months. He complained of gas at all times, whether the stomach was empty or full; but after eating there was an intolerable pressure. He also had attacks of headache and what he termed "biliousness." His fear of eating and, in fact, fear of everything, was exaggerated to such a point that he was as a small child.

Fluoroscopic examination at that time showed the stomach to be moderately ptotic with very rapid emptying and very little pyloric control. The cap was large and normal in shape. Large masses of barium would drop to a big, dilated second and third part of the duodenum, which appeared to be, at times, between two and three inches in diameter. Operation was advised and finally consented to when he was so weak as to be almost moribund. I operated upon him on March 23, 1922, opening the abdomen through an upper right rectus incision. There was absolutely not a sign of fat left in the abdominal wall or in the abdominal cavity. What had been the omentum consisted of the areolar tissue and blood vessels. The duodenum was found tremendously dilated, being almost as large as the stomach. It was not only extremely broad but was very long and tortuous. It was surrounded by adhesions which ran to the gall bladder and posterior abdominal wall, but they, apparently, did not cause obstruction. The gall bladder was white and distinctly abnormal and appeared to have a constriction about its mid-portion. Because of the absence of all fat, the bile ducts were very plainly seen and also were found to be dilated. Enough of the adhesions were divided so that the duodenum was made somewhat more mobile, but it was evident that these adhesions had nothing to do with the dilatation. The colon and stomach were then turned back and the dilated portion of the duodenum could readily be seen under the mesocolon. The superior mesenteric vessels could be seen coming down over this part, but it could not be definitely stated that pressure from them was the cause of the obstruction, although such was thought to be the case. It would have been distinctly possible and comparatively easy to do a duodeno-jejunostomy and obtain good exposure, but his condition was so desperate that it was decided to be more conservative and do a gastro-jejunostomy, which was quickly done. Eight hundred c. c. of glucose solution were given through the stomach tube while he was still on the table, and he left the table in good condition.

While his condition was not made worse by the operation, apparently neither was it benefited. He died from inanition eight days after operation. Autopsy was obtained. The gastro-enterostomy wound was perfect and there was no evidence of any leakage having occurred. The duodenum was tremendously dilated. The cause of the obstruction was found to be, definitely, pressure by the mesenteric vessels, which, even after death, left a marked constriction in the wall of the duodenum at their crossing. The duodenum was nearly as large as the stomach. Eighteen inches above the ileocecal valve was a very marked Meckel's diverticulum about four inches long. A fibrous appendix was found, running straight backward until it came to a hole in the peritoneum, through which it passed, and was adherent to the posterior abdominal wall for a distance of a couple of inches post-peritoneally. No other abnormality was found and no evident cause for death excepting the supposition that he died from the duodenal intoxication and exhaustion. This case well illustrates the fact that a gastro-jejunostomy is useless in this condition.

The Rochambeau.

DISCUSSION

Dr. A. L. Levin, New Orleans, La.—The textbooks do not often mention cases of marked duodenal dilatation caused by enteroliths and fecaliths.

Last December, I saw a middle-aged woman who was suddenly taken ill with the ordinary symptoms of indigestion, complaining mostly of marked nausea, almost a persistent vomiting and regurgitating bile with a marked distension of the upper abdomen and loss in weight. The appearance of the skin suggested that we were probably dealing with some gall bladder disturbance. I introduced the stomach tube and found a large quantity of green fluids, evidently duodenal contents, regurgitating into the stomach. She was put on a full diet for another 24 hours to determine whether or not there would be again a marked duodenal regurgitation. The following day the stomach tube was introduced again and over a half gallon of green fluid, lighter in color, but evidently duodenal fluid, was found. The x-ray examination showed a giant duodenum. We were satisfied with the diagnosis of duodeno-jejunal obstruction and advised operation. On opening the abdomen, we found no obstruction at the duodeno-jejunal junction, although the duodenum was markedly dilated. There was no pathology in the small intestines, but the entire colon from one end to the other was filled with fecaliths. The abdomen was closed and the patient died six hours later. The surgeon said he had lost nine out of 12 such cases from profound

shock. These patients are toxic and cannot stand operative interference.

Three weeks later I saw a patient who was being prepared to go to the operating room. Her appearance did not indicate a serious condition except that she was extremely uncomfortable from the constant regurgitating and vomiting and distension of the upper abdomen. There was a slight rise of temperature and slightly rapid pulse. On examination I found marked tympany, but to the right there was dullness and one could make out a mass. The surgeon thought it was probably a ruptured appendix with obstruction. The lesson I had learned from the first patient suggested that there was probably some trouble in the colon, a fecalith, or, probably, an enterolith. I asked that operation be delayed to see if something could be done in a medical way. For 11 days there was no bowel movement and no flatus could be obtained, demonstrating that there was marked obstruction. Intussusception was suspected. We put the patient in a knee-chest position; one pint of warm olive oil was given by high rectal tube, and she maintained that position long enough to allow it to reach the cecum. Two hours later an alum enema was administered and then hot saline irrigation. A short time after this procedure fecal matter appeared and in a very short while she had a bowel movement and expelled a large enterolith about the size of a small lemon. That was the end of the obstructive trouble and she made a good recovery. When the stone was opened it was found to consist of cholesterin.

The conclusions I have reached on this subject are: That a giant duodenum is not a very rare clinical and surgical entity; that the small intestines from the jejunum down to the lower end of the ileum may remain normal and an offending obstacle in the colon will jump across this entire tract and attack the duodenum, causing a marked duodenal dilatation; that fecaliths or enteroliths will cause marked duodenal dilatation resulting in gastric atony; that large quantities of duodenal fluid, when found in the stomach, should make us suspect marked duodenal dilatation. The surgeon before opening the abdomen for relief of intestinal obstruction should ascertain the condition of the stomach, introducing a stomach tube to see if the stomach is not filled with fluid. The radiologist in studying the gastro-intestinal tract should not limit his observation to the upper part of the tract, but conclude a series of observations on the lower tract as well. A marked reverse peristalsis should be looked upon as a condition requiring careful study and observation. In my opinion, reverse duodenal peristalsis is the primary cause of so-called "heartburn."

Dr. G. C. Mizell, Atlanta, Ga.—The x-ray is somewhat deficient in showing the outline of the duodenum. This is especially true in showing the location of an obstruction.

About 18 months ago I developed a method of visualizing the small intestine, which is especially applicable in this region. If one will take two tubes, one slightly smaller than the other, having on the end of the smaller tube the Einhorn's duodenal tip, and surround this tube with a rubber bag and then in the outside larger tube make openings just behind the rubber bag, an instrument will result with which one can visualize any part of the duodenum. It will give the angulations and the constriction and one can do away with peristaltic motion. This visualization is accomplished by distending with air the rubber bag, which is on the point of the tube, then a barium mixture is introduced behind the bag through the larger tube. In this way one can demonstrate accurately the size of the duodenum, locate the angulations, and also demonstrate whether or not the pylorus is relaxed. In making this examination in apparently normal individuals, it is not possible with the amount of pressure that I have used to cause a regurgitation of the barium meal into the stomach. I have not used over 60.

Dr. Verbrycke (closing).—I was extremely interested in this new method of x-raying and I can see how it might be very valuable.

There are two points on which I might differ from Dr. Levin, at least theoretically. I doubt that in his cases the fecaliths directly produced mechanical obstruction with dilated duodenum. The colon is weighted down with the contents and this drags on the duodenal angulations. It does not follow the general law of obstructions that a complete segment of bowel should be skipped and that we should have an obstruction in the colon, the intervening bowel normal and a dilatation of the duodenum. The actual cause must be a functional increase in the angulation, kinks, etc., and they can not always be demonstrated at operation.

SYMPTOMATOLOGY OF CHRONIC INTESTINAL STASIS*

By CHARLES G. LUCAS,
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The widespread publicity about "auto-intoxication" not many years back accentuated a fear, long prevalent in the minds of the laity, concerning any condition of the body relative to retention of fecal material within the bowels. In some cases every possible symptom is attributed to the failure of the bowels to act even for a single day, while it is the experience of all of us that some cases where chronic intestinal stasis is marked present no symptoms, but on the contrary are full of energy and able to attend to their every-day affairs.

Any interference with the normal

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rhythmicity of the bowels naturally has some effect, and if long continued the effect becomes more and more marked. When we consider the long list of causes that lead to chronic intestinal stasis, it is remarkable that more trouble does not ensue. Here, however, the individual resisting power of each case plays an important part.

The work of Lane has focused our attention on chronic intestinal stasis as the cause of many symptoms, but I think it has been definitely shown that the need of surgery in this condition is only in a limited number of cases.

When we consider, for an example, the influence of the various infections, we find in certain cases, as has been shown by Smithies[1] and others, that the wall of the intestine shows quite well the effects of acute and subacute infective processes, a real tissue infection, even to the scarring as a result of repair; in other words, a myositis of the intestinal wall itself. This leads to interference with the normal intestinal contractions of the bowel and gradually symptoms develop.

And as to these symptoms opinions differ. Lane and his followers believe that chronic intestinal stasis is productive of so many changes in the body that nearly every organ shows its effect; on the other hand, many observers believe that stasis itself is not incompatible with good health in many cases and in those cases that have marked symptoms, careful analysis will show other organs to be the exciting cause.

However, the question of absorption of poisonous toxins has given rise to much discussion and many investigations. It has been shown that there are at least 176 types of organisms that may be harmful, and I think it will be admitted that with such interference with normal contraction of the bowel, as we have in stasis, with the myositis produced and the possible breakdown of the natural defense of the organism, certain clinical phenomena may be produced.

The symptomatology will depend much on the type and cause of stasis.

The subject of focal infections has been pre-eminent. The influence of infected tonsils, teeth, sinuses and the results of infected gall bladder, appendix and other abdominal organs may be the exciting focus of the changes in the colon so graphically described by Lane. Undoubtedly, many cases begin in childhood, due to habitual overloading of the intestinal tract and even with the pathological changes that develop as the patient grows older and is subject to the different acute infections, there may be no change from the ordinary until some factor as a psychic breakdown occurs and the symptoms of stasis develop.

These may be classified as to type. When due to increased intra-abdominal pressure from tumor of various organs, the symptoms develop slowly to a certain point and then become well marked; when due to infective processes in the bowel itself, the symptoms vary. In some cases, so long as the contents of the colon are fairly solid, the patient is comfortable. But so many of these patients are obsessed with the "regular" action of the bowel that purgatives are usually taken daily and as a result the effort is being constantly made to keep the bowel contents in a fluid state, a condition in which bacterial changes are increased and absorption of toxins favored.

In the well marked case every possible symptom will be found. The patient gradually loses flesh and becomes undernourished. The quantity and quality of food is diminished and this factor, together with the constant use of purgatives, tends to exhaust an already fatigued bowel. With this loss of flesh and inadequate food supply, a state of malnutrition develops with all of its accompanying symptoms.

The gastro-intestinal canal shows the effect of chronic stasis in the changes in the form and position of the intra-abdominal organs. The inability of the liver to accommodate itself to these changes results in various symptoms. The tongue is coated, and the breath becomes foul. In some cases, nausea and vomiting are the prominent symptoms. In one of my cases under observation for the past ten years this has been marked. During this time this patient has been subjected to five abdominal operations, the last of which, a colostomy, has given some relief from this most distressing symptom. In some cases abdominal distress, flatulence and even

pain, at times, is noted particularly after the use of purgatives.

Lane has emphasized the changes in the skin, particularly the pigmentation which he notes first in the eyelids with gradual spreading over the entire body. This he attributes entirely to the effects of chronic stasis but, according to Daniel,[2] this condition is not special to gastro-intestinal toxemia, but is likely due to some septicemic condition involving the adrenals and other organs. Other changes noted in the skin by various observers are purpuric manifestations, eczema, chronic urticaria, toxic erythemata, acne and furunculosis.

The influence of chronic stasis on the nervous system is marked. Many cases exhibit marked depression, melancholia, loss of energy, cold extremities, anxiety, insomnia and among other symptoms, headache. Even in ordinary constipation, headache is the chief and most dreaded symptom. In a case of chronic stasis that dates back to a severe typhoid infection in early manhood, this has been the predominant symptom. Like the case reported earlier in this paper, this patient has been under observation for years, and likewise has undergone a number of abdominal operations, including appendectomy, cecostomy and several "for the relief of abdominal adhesions" without relief. With the headache and loss of energy we often have the symptom-complex of neurasthenia with the anxiety phobias and in some cases, even delirium and coma. It is only a few years back that epilepsy was believed to be due to chronic intestinal stasis and numerous cases had the colon removed.

Various types of arthritis have had chronic stasis inscribed as the etiological factor. With this we have also neuritis and neuralgia. An example of the mechanical form of chronic stasis being the cause of neuritis was seen in a man of fifty with the history of neuralgia of long standing. During childhood he would often go from one to two weeks without a bowel movement. After some days spent in cleaning out the colon, a barium enema revealed a markedly dilated descending colon without any evidence of obstruction. Under the influence of diet and medication he is now able to keep his bowel fairly well opened and is practically free from the evidence of neuritis.

Dilatation of the heart with myocardial weakness, dyspnea, irregular pulse and palpitation have all been ascribed to chronic stasis. Sir James Mackenzie[3] has called attention to toxic angina and the exhaustion that such subjects suffer in the following words:

"It is not always easy to find the real cause of this condition, although I think that there is now enough evidence to show that, in many cases, it is due to some toxic influence. A very considerable portion of those who suffer so readily from exhaustion have distinct evidence of gastro-intestinal troubles. Many complain of different signs of dyspepsia, and we can often detect evidence of stasis in some portion of the intestinal tract even when there is no complaint made by the patient of indigestion. Constipation is often present. Many years ago I was struck by the disappearance of those characteristic vasomotor phenomena (cold hands and feet) in a man with chronic duodenal ulcer, on whom a gastro-enterostomy had been performed.

"Although absorption of the products of decomposition from the intestines is probably the most common cause, absorption from other centers of infection is possible, as from the teeth, and obscure inflammatory conditions such as chronic appendicitis. A typical form is seen after exhausting illnesses such as typhoid fever or influenza. In fact, any prolonged bacterial infection may give rise to it."

Not only have various cardiac affections been ascribed to chronic stasis, but the many changes leading to arterio-sclerosis also. In fact, a review of the literature will show that every organ in the body has been involved in this discussion at various times. Reflex asthma and other pulmonary conditions and the various changes that give rise to the different forms of nephritis are included. Also, the development of exophthalmic goiter and even the beginning of malignant disease of various organs come within the wide range of chronic intestinal stasis.

These symptoms may even yet be multiplied and I believe that the entire symptomatology of intestinal stasis will continue to be unsettled until the problem of "intestinal toxemia" is settled.

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HYPOTHYROIDISM*

By JOHN T. KING, JR., M.D.,
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It is interesting to recall that the death of the first patient treated for myxedema by thyroid extract recently took place. Eleven years after Gull's description of myxedema (1884) Schiff, having successfully transplanted the thyroid gland into the abdominal wall, suggested that treatment of patients suffering from thyroid insufficiency by feeding thyroid preparations might be feasible. Inspired by this work, Sir Victor Horsley, after successfully disproving some of the older views of thyroid physiology by his careful experiments, agreed with Professor Murray that it seemed reasonable to attempt the treatment of myxedema by artificial substitution of the thyroid gland. Accordingly, Murray began in the early nineties to treat a typical case of myxedema by means of hypodermic injections of a glycerin extract of sheep's thyroid. The patient, a woman, developed myxedema at the menopause (age 42). After the treatment was initiated by the subcutaneous route it was continued for years by mouth. Meanwhile the patient had been entirely cured two months after the beginning of treatment. She lived 28 years after the treatment was begun and died a few years ago of heart failure at the age of 74. This clear-cut work provides a beautiful demonstration that deficiency of thyroid secretion may be perfectly replaced by a method of treatment which is as simple as any in the physician's armamentarium. Because the treatment is so entirely satisfactory in such instances, it behooves us all to use every means at our disposal for recognition of the cases. This report has been prepared to bring to your attention some data, clinical and laboratory, bearing upon the thyroid insufficiencies that have come to me from hospital statistics and private practice during the past few years.

In 1895, Magnus-Levy reported that administration of thyroid preparations raised the rate of both oxygen and carbon-dioxid exchange through the lungs, and in 1904, in a report on myxedema, he pointed out the principles of interrelationship between thyroid activity and basal metabolism. In four patients without myxedema, he was able to increase the total metabolism by the administration of thyroid gland, while in five other subjects no such effect was observed. In every case of myxedema, however, it was found that the total metabolism was increased by thyroid treatment. He noted that the effect was apparent within the first week, gradually increasing over a period of four to five weeks, and that the metabolism fell to the previous level within two to three months after thyroid was discontinued. All recent work has verified Magnus-Levy's observation of the fact that the metabolism in myxedema is always elevated by vicarious thyroid therapy provided it can be brought into the circulation.

Among the various indications of hypothyroidism as it is studied today, I believe it is safe to say that reduction of the basal metabolism is the most constant single evidence. This report has attempted to correlate the clinical reports of a considerable number of patients and the basal metabolism determinations, so that each acts as a check upon the other. Sturgis has described the status of myxedema with metabolic findings in a very thorough manner. His cases are outspoken instances, for the most part, of thyroid insufficiency. Most of our observations will be concerned with mild or borderline cases.

All determinations of the basal metabolism in this series were done by the carbon-dioxid collection open method described by me. An analysis was made of 200 consecutive and unselected determinations which represent the routine estimations at the Johns Hopkins Hospital over a period of about a year. I am indebted to the various attending physicians of the Hospital for clinical data from the Hospital records.* From these 200 tests emerged 36 instances of hypothyroidism, provided we consider all patients with a basal metabolism of minus 10 per cent or less as falling within this category. Stur-

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*The technical work was done by Miss Virginia B. Cross.

gis reported a case of a physician who persistently showed a basal metabolism more than 20 per cent below the average, and who was free of symptoms. In this group of ours however, all patients were in the Hospital with symptoms. In view of the clinical aspects of this series as well as the metabolic findings, it seems to me better judgment to consider patients with a basal metabolism between 10 and 15 per cent below the average as instances of probable mild hypothyroidism rather than as normal individuals, except for certain specific cases, which I shall mention. In my experience the basal metabolism below minus 10 per cent is of more significance than one above plus 10 per cent. We know of no accidental causes, provided the patient is not being drugged, that are apt to lower the basal metabolism beyond normal limits, while restlessness, cold, superventilation and the accidental taking of food tend to elevate it.

Sex.—Thirty cases of reduced basal metabolism were found in women and 6 in men. This is in accord with the usual observations that the disease is more characteristic of women, especially at and after the menopause.

Age.—The age by decades of the cases with low metabolic rates is as follows: 10-20, 2 cases; 20-30, 8 cases; 30-40, 6 cases; 40-50, 8 cases; 50-60, 11 cases; 60-70, 1 case. It will be seen that half the number of cases are recognized between the ages of 40 and 60, at and after the climacteric in both sexes.

Associated Clinical Conditions.—The essential clinical conditions, so far as any one condition could be called essential, that were associated with the depression of the basal metabolisms were as follows:

Colloid Goiter	7
Menopause	6
Malnutrition	4
Chronic arthritis	4
Primary hypothyroidism	4
Previous thyroidectomy	3
Previous oophorectomy	3
Hysterectomy	2
Gall stones	2
Psychoneurosis (neurasthenia)	2
Obesity	2
Hypopituitarism	1
Encephalitis	1
Cystadenoma	1
Ureteral stricture	1
Cirrhosis of liver	1

Level of Basal Metabolisms.—The level of the metabolic rate prior to treatment in these cases was as follows: minus 30-40, 1 case; 20-30, 6 cases; 15-20, 16 cases; 10-15, 13 cases.

By far the most important group for study is that of cases with metabolism between minus 15 and minus 20 per cent. These are cases in which glandular insufficiency is marked enough to produce symptoms, but in which clinical evidences are often equivocal. While the skin is usually dry, outspoken myxedema has not yet developed, the pulse may be rapid or slow, there may be goiter or a small thyroid, and the determination of the basal metabolism is of the greatest aid, since such patients are, almost without exception, greatly benefited by therapy. These cases are more difficult to recognize upon clinical grounds, in my opinion, than are those of mild hyperthyroidism, and in my own practice I get more real aid from this test in the recognition of thyroid insufficiency than even in hyperthyroid states.

Pulse and Basal Metabolism.—

BASAL METABOLISM			
30 to 40	20 to 30	15 to 20	10 to 15
PULSE RATES			
(Woman)	(All women)	(All women except 3)	(All women except 3)
80	58	90	90
	70	72	78
	80	74	64
	70	68	70
	82	80	58
	58	70	64
		60	80
		60	84
		58	98
		70	64
		88	60
		72	58
		70	80
		80	
		62	
		76	
Tot. 80	418	1150	908
Av. 80	69.7	71.9	69.8

These pulse rates are so normal that one finds it difficult to draw any conclusions from them except in a negative way. Certainly there is no such close parallelism between pulse rate and basal metabolism as Tompkins and Sturgis have pointed out in cases of increased metabolic rate. It is generally believed and taught that a slow pulse rate is one of the indications of a hypothyroid state, but the above figures make this conception very doubtful. This observation, namely, that the pulse is not consistently reduced in hypothyroid states, makes the diagnosis of this condition more difficult than that of hyperthyroidism, in

which the resting pulse is of great diagnostic aid.

Primary and Secondary Hypothyroidism.—A subdivision of hypothyroidism into primary hypothyroidism, due entirely to a lack of thyroid activity, and secondary hypothyroidism, due probably to some other condition primarily but reflected in a low basal metabolism, has been made, and it seems to me that this is justifiable. In analyzing the cases in this series there are found 24 instances in which the basal metabolism is associated with evidence of essential hypothyroidism (thyroidectomy, myxedema, etc.), and 12 instances in which other conditions hold the center of the picture. In the latter group are such cases as those following oophorectomy, pituitary disturbance, chronic arthritis and so on. Plummer has also pointed out that subcutaneous edema is not characteristic of cases of low basal metabolism of secondary nature as it is in primary hypothyroidism. There is also a difference in the reaction of the two groups under therapy, as it has been found that the "primary" cases do very well on small doses of thyroid while large doses are not so productive of results in the other type of case.

Hypothyroidism and the Ovaries.—There has been a difference in the results from experimental castration of female animals, but one gathers from the literature that there is a general tendency toward a depression of the basal metabolism following castration in either sex. In an excellent summary of this work Aub finds the weight of experimental evidence in favor of the belief that castration lowers the total metabolism, probably through depression of thyroid activity following removal of the gonads. I have done metabolic determinations upon a few patients who had had double oophorectomy and found them within normal limits. However, two cases of the group analyzed here followed oophorectomy and a third patient had had both thyroidectomy and oophorectomy performed three years previously. This last patient was given 5 to 10 grains thyroid extract a day for a considerable time, with an elevation of the basal metabolism from minus 29 to minus 12 per cent. At this level she appeared overstimulated and the dosage had to be restricted. Now, one case is not enough to warrant conclusive opinions, but in treating this patient I think every one felt that there was more to be dealt with than a mere hypothyroidism with reduction of metabolism. The metabolism and clinical condition did not respond to treatment in the way a case of primary hypothyroidism does and one had a definite feeling that the oophorectomy acted as a complicating factor in preventing her complete recovery under thyroid therapy. I am in no position to say how such a relation operates.

The frequent onset of hypothyroidism at the menopause suggests a relation between ovarian and thyroid activity. It seems to me advisable to do a basal metabolism test whenever practicable upon women who suffer severely at and after the menopause. Slight reductions in the basal metabolism at this age, however, must not be taken too seriously because of the lack of knowledge of the normal metabolism in women of this age. There are comparatively few actual observations upon normal women of middle and late life, and, while my work is with patients and I cannot contribute normal figures from women, yet I have felt for some time that our standard figures for this class of subjects may be a little too high. If hypothyroidism is so common after the menopause, might there not be some depression of the thyroid in a normal woman after the menopause? More work is needed in this field.

Hypothyroidism and Colloid Goiter.—Colloid goiter is the most common cause of reduced basal metabolism in our series. Plummer says the basal metabolism in colloid goiter is usually between minus 8 and minus 15 per cent. All in our series fell between minus 10 and minus 15 per cent except one case in which it was minus 15.9 per cent. We have not considered those in which the basal metabolism was higher than minus 10 per cent in this series. It is readily seen, however, that colloid goiter is a very common cause of slight thyroid insufficiency, but not of the more severe grades of hypothyroidism.

Hypothyroidism and Pituitary Disease. Benedict and Homans have demonstrated a gradual fall in the basal metabolism following the extirpation of the anterior lobe of the pituitary in dogs. The clinical association of reduced metabolism with hypopituitarism is generally accepted, and our one case in this series supports the usual belief. Aub believes that this reduction in basal metabolism may be brought about through the medium of the thyroid gland. According to Dock, the hypophysis has been frequently found enlarged, degenerated or atrophied in myxedema.

Obesity.—Simple obesity is not due to thyroid insufficiency, as Means has shown, and as the experience of all of us who use the metabolism test in diagnosis tends to show. Contrary to our preconceived ideas, the obese patient, in my experience, is more apt to have a metabolic rate a few per cent above the average than to have it below, while the undernourished individual is more apt to show a metabolic rate below that of robust individuals. It seems, then, that the obese patient suffers the results of an unusually good assimilative or anabolic apparatus rather than of a slow metabolism. The undernourished patient, on the other hand, suffers from under-assimilation rather than over-destruction of foodstuffs. While a good many individuals with hypothyroidism gain weight as it is developing, many of them are decidedly undernourished and gain weight under thyroid therapy.

Hypothyroidism and Arthritis. — The presence of 3 cases of chronic infectious arthritis and 1 case of hypertrophic arthritis in this series raises the old question as to the relationship of arthritis to hypothyroidism and the treatment of arthritis by thyroid extract. Cecil, Barr and DuBois have studied 9 cases of various types of arthritis in the chamber calorimeter and failed to find any significant alteration in total metabolism. A large series of observations of the basal metabolism (29) are recorded by Pemberton and Tompkins from soldiers with various forms of arthritis. Of this series 80 per cent were within normal limits, while 20 per cent were slightly subnormal: 8 results were above the average and 20 below. The subnormal figures ranged as low as minus 21 per cent. Of our 4 cases 2 were between minus 10 and 15 per cent and 2 between minus 15 and 20 per cent. It seems to me that there is an indication from such figures of a slight tendency to reduced metabolic rate in chronic arthritis, but whether this is due to any glandular deficiency, to the immobility incident to the condition, or to malnutrition I cannot say. I believe, however, that the field is open for further study, particularly of the chronic deforming and hypertrophic groups in people of middle and late life. Pemberton and Tompkins' series deals with soldiers most of whom were not suffering from the more serious and chronic forms of arthritis that fall to the lot of the practitioner. It seems to me that the common feeling among clinicians that an acceleration of the metabolism (from thyroid extract, vaccine, etc.) may do good in certain cases, deserves further metabolic studies of selected groups of cases.

Following Thyroidectomy.—Owing to the very ready hyperplasia of which thyroid cells are capable, the tendency of the surgeon now is to be rather radical than otherwise in the amount of thyroid gland removed at operation. The presence in this series of three instances of cachexia strumipriva shows us that the danger of bringing on this condition by operation is not yet a thing of the past. The two most severe hypothyroid states were of this origin.

The Skin in Hypothyroidism.—Next to metabolic changes, with their resultant lassitude and fatigability, probably the most characteristic feature of hypothyroidism is dry skin. This is especially noticeable on the extremities, about the elbows and below the knees, and is associated with a decrease or absence of perspiration.

Eczema.—Suspicion of thyroid insufficiency in various skin troubles, including eczema, is found in the literature.

Miss C., a white woman fifty years old, had had violent attacks of acute eczema implanted upon a chronic eczema since the age of 13. At 5 years of age her skin was noted to be dry, but no eczema appeared until eight years later. Since then, in spite of local treatment by some of the best dermatologists in the country, the trouble has persisted. She never sweats. General exam-

ination was negative except for the severe eczema and general dryness of the skin. I was not certain whether I could feel any thyroid gland or not. She is improved, but owing to great sensitiveness to thyroid extract she has been treated rather sporadically. B. M. at first was minus 17 per cent, after treatment minus 8 per cent.

Ichthyosis.—This has long been considered an incurable affection owing to its obscure etiology. Recent light has been thrown upon it by Krogh and With, who, on the basis of 21 determinations, found a relationship between ichthyosis and hypofunction of the thyroid gland. They obtained favorable results from treatment.

Case II—Mr. H. was a white man 24 years old, and single. A maternal uncle had ichthyosis throughout his life, and the patient was born with ichthyosis. The past history was entirely negative. The skin condition is much better in summer and worse in winter. No definite subjective symptoms could be elicited except lack of perspiration. The patient was short and thick set. The hands were typically "spade-like;" the fingers short, the hair thin and had been breaking. He had widespread ichthyosis, for which he consulted a dermatologist. Dr. Pels suspected an endocrine disturbance and asked me to examine him with this in mind. The thyroid gland was not distinctly felt. Examination was otherwise negative except for mild secondary anemia. There was definite clinical improvement and the patient has been practically free of skin harshness since the onset of treatment. We are anxiously awaiting cold weather to test the cure. B. M. at first was minus 16.5 per cent, after treatment minus 2 per cent.

Treatment.—Either thyroid extract or thyroxin by mouth is efficacious except in those cases in which they are not absorbed from the gastro-intestinal tract. I have followed two cases in which no absorption took place. In one case the pulse and basal metabolism remained stationary under treatment and in the other case both pulse and basal metabolism fell in spite of considerable doses by mouth. I am accustomed to use thyroid extract by mouth, but if no absorption takes place thyroxin, which is soluble, may be injected subcutaneously. Plummer finds that about 1 milligram of thyroxin is used daily in the body. Beginning with 0.5 milligrams daily, the dose should be adjusted to bring the basal metabolism gradually to within normal limits, provided no untoward symptoms occur. In primary hypothyroidism 1 to 2 grains of thyroid extract daily by mouth usually suffices to supply the need for thyroid and to maintain the metabolism within normal bounds. In the "secondary" type, those cases with reduced basal metabolism of rather obscure origin, 5 to 10 grains daily may be needed, and even then the improvement is not so striking as it is in the "primary" cases.

It is a common observation that patients with hypothyroidism are especially sensitive to the effects of thyroid extract, more so than are normal individuals (Dock). I have observed anginal pain under treatment in a well controlled case with a metabolism that had never been above normal. Another patient whose basal metabolism was 17 per cent below the average normal was so sensitive to the drug because of its exciting effect that treatment had to be approached with extreme caution.

Because of the violent metabolic results of thyroid therapy, the very chronic condition of hypothyroidism in most cases, and the sensitiveness of these patients to thyroid extract, treatment should be begun with small doses and with the patient resting most if not all of the day. It is very tempting to try to obtain a spectacular cure during a few weeks in the hospital, but it is better to carry out treatment over months and to make the readjustment gradually.

SUMMARY AND CONCLUSIONS

(1) An analysis of 200 consecutive determinations of the basal metabolism at the Johns Hopkins Hospital showed 36 instances of basal metabolism less than minus 10 per cent.

(2) Most of these cases are believed to have suffered from thyroid insufficiency, while in a few the cause of the depressed basal metabolism is not clear.

(3) Determination of the basal metabolism is of even more diagnostic aid in cases of hypofunction of the thyroid than in hyperthyroidism, particularly because of the contradictory pulse findings in hypothyroidism and because the clinical manifestations in general are not so clearly defined as they are in hyperthyroidism.

(4) Hypothyroidism is much more common in women than in men and one-half the cases in this series occurred between the ages of 40 and 60. In protracted meno-

pause symptoms, hypothyroidism should be suspected.

(5) Cases of chronic eczema and ichthyosis complicating hypothyroidism are included.

(6) It is believed that the differentiation of cases of hypothyroidism into those that are "primary" and those that are "secondary" is justified. In many of the "secondary" cases, however, the condition responsible for depression of the basal metabolism is probably not thyroid deficiency alone.

(7) Treatment by mouth with thyroid extract or thyroxin or subcutaneously with thyroxin should be begun with great caution and continued gradually over months until the basal metabolism is within normal limits. If untoward symptoms develop the dose should be temporarily reduced. Cases of non-absorption of thyroid extract and thyroxin are mentioned.

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DISCUSSION

Dr. Thomas P. Sprunt, Baltimore, Md.—There are two points which I should like to mention in the discussion of Dr. King's paper. The first is the importance of hypothyroid states in medical diagnosis, prognosis and prophylaxis.

We have sufficient clinical and laboratory criteria to give the hypothyroid state a satisfactory scientific status. Every organ and tissue in the body may be affected by it. The effect upon growth and development has long been recognized. In the circulatory system degenerative processes may lead to the early development of arteriosclerotic and myocardial lesions. In the gastro-intestinal apparatus, the atony and muscular weakness may result in constipation, intestinal stasis and its attendant evils and, in the opinion of a number of writers, a predisposition to the formation of gall stones. In the nervous system, various psychoneurotic manifestations and the possibility of psychoses are to be considered; and in the integument, besides the myxedema and characteristic dryness of the skin, the tendency toward various dermatopathies which may clear up like magic with the proper thyroid therapy. In the field of general metabolism there is an increased susceptibility to infectious diseases. Obesity adds its deleterious influence, especially after middle age, and, perhaps with the involvement of other endocrine glands, a distressing symptom complex like adiposis dolorosa may ensue. Marine believes that an exhaustion atrophy, as he calls it, of the thyroid is the most constant pathological lesion found in Dercum's disease. Many of these predispositions may be minimized or removed if we keep constantly in mind the importance of constitutional studies, of the early recognition of masked cases of hypothyroidism and other predisposing states, and of individual prophylaxis based upon them.

The second point is the mention of the interesting observations of Curschmann and other German clinicians on what they consider the effect of war diet upon thyroid diseases. Curschmann's paper was written with special reference to exophthalmic goiter, but is of interest also in regard to hypothyroidism. He noted that both in the clinics and in private practice there was a smaller number of cases of exophthalmic goiter during the war years, also fewer severe cases, and several severe ones in women on war ration healed remarkably well and did not need operation. There was an increase in the number of hypothyroid cases. He sent a questionnaire to twelve clinicians and ten of the twelve answered that their experience was similar to his. After 1919, there was a marked increase in the incidence of exophthalmic goiter. He attributes the change to the meager war diet, poor in protein (30 to 40 grams a day), poor in fat (very little milk or butter and no cream), the total caloric value being approximately 1500-1800 calories. These observations and his deductions are in opposition to the prevailing idea of prescribing high calorie diets in the treatment of exophthalmic goiter. He points out that while some clinicians advocate a restriction of meat, all give milk and cream and a high calorie diet. He thinks that perhaps overfeeding of these patients is a harmful irritation in view of the already increased metabolism. He states further that the body worked more economically on the war diet. A sparing system was automatically set up and probably the thyroid was the regulator of this automatic sparing system. With this undernutrition and depression of thyroid activity there was an increased incidence of thyroid atrophy and of myxedema.

We were already acquainted with the retarded basal metabolic rates in inanition which Curschmann would evidently explain in this way.

Major Samuel A. White, Washington, D. C.—A lowered basal metabolic rate is the most constant single evidence of hypothyroidism, though I think it should be said that even a markedly lowered rate is by no means pathognomonic of this condition. Like all workers in metabolism, I have encountered low basal metabolic rates in individuals presenting no demonstrable sign of hypothyroidism; and while, in such individuals, it may be impossible to say that there is no hypofunction of the thyroid, I believe that there are conditions, quite apart from a real hypothyroidism, which are characterized by a lowered metabolism level.

I have encountered no individuals with a rate as low as minus 20 per cent without unmistakable signs; but there have been numerous cases with rates between minus 10 and minus 20 per cent, which, while showing sufficient reason to warrant their physician's referring them for a basal metabolism study, were clinically very indefinite; and it is in the latter type of case that a determination of the basal metabolic rate is of the greatest help..

Dr. King does not state which of the several sets of so-called "normal" figures that have been advanced by different workers was used in computing his rates. I assume that it was the Aub and DuBois standard; and, if this assumption is correct, I agree with him that a rate between minus 10 and minus 15 per cent is of more significance than one between plus 10 and plus 15 per cent. It has been the practice in my laboratory to regard the normal range, when using the Aub and DuBois standards, as lying between minus 10 and plus 15 per cent, which simply means, of course, that I regard the generally accepted absolute normal (i. e., plus or minus zero per cent), as being really about 2.5 per cent too low.

Dr. King's distribution of cases with regard to sex agrees with mine. The majority of cases occur in the female.

As to the age of distribution, however, I am not in entire accord with the figures presented. I do not believe that, as in the series cited in the paper, over one-half of these cases lie between the ages of 40 and 60 years. I have had a number of cases between 20 and 40 years, quite a few under 20, and certainly several before the onset of puberty. This difference between my own experience and that of Dr. King may be due to the common practice in the Army (where medical attention is available without limit or cost) of having the children, as well as the older members of a family placed under observation for the slightest apparent cause. But, whatever the explanation, it is my impression that the great bulk of cases of more or less indefinite hypothyroidism are about equally divided between the period preceding 20 years of age and that lying between 40 and 50 years, with a minority of cases falling between 20 and 40, and above the age of 50 years.

With regard to the associated clinical conditions, I do not think that hypopituitarism is correctly represented by Dr. King's 1 in 36 cases. Seldom, if ever, I believe, is any case of endocrine disturbance a purely monoglandular affair; and this is especially so of disturbances on the "hypo" side. Hypofunction of the pituitary is very frequently associated with hypofunction of the thyroid, especially in the more or less doubtful or borderline cases which are the subject of the paper under discussion.

Following the same line of thought, I cannot quite agree with the division of these cases into primary and secondary hypothyroidism. The cases classed as "primary" probably are hypothyroid in nature, while those included in the so-called "secondary" division, I believe, are not, except as the thyroid may participate in the general lowering of the metabolism level; and this belief is borne out by their failure to progress clinically as do the real cases of myxedema, and also, as Dr. King points out, by their general lack of symptoms, and by their failure to respond to thyroid medication alone as do the typical hypothyroids. This failure to respond to thyroid administration is proof positive that we are not dealing with hypothyroidism *per se;* and I have accordingly, in certain such cases, ventured to supplement the thyroid medication with one or another of the other internal secretory glands, frequently with good result. I am not advocating a blind polyglandular therapy. "Shotgun" prescriptions have no more place in endocrinology than in any other branch of medicine. But in a large proportion of these cases in which thyroid alone fails, or where there is manifested an undue resistance to thyroid, improvement follows when smaller doses of thyroid are combined with, for example, small amounts of pituitary or ovarian extract, the choice of preparation in each instance depending on the clinical aspects of the case.

Dr. King refers to the marked sensitiveness to thyroid medication exhibited by certain cases of hypothyroidism. This sensitiveness, I believe, is due to the extreme avidity with which the tissues of these individuals absorb the thyroxin upon its administration. The tissues in such subjects have been starved of their normal physiological concentration of thyroxin; and the sudden restoration of this shortage results in the reaction seen, which may be severe. One case under my observation went on to serious collapse. All of which simply lends point to the observation that treatment of these cases should be begun with caution.

The mild and borderline cases showing decreased basal metabolic rates are not definitely characterized by a lowered pulse rate. The pulse rate may be almost anything. But the real hypothyroid is characterized by a very definite decrease in the pulse rate, usually 60 or less per minute in the "fasting-resting" state.

Dr. W. S. Thayer, Baltimore, Md.—Hypothyroidism in milder degrees is often overlooked, and in severer instances may be confounded with nephritis. I shall mention two cases. One of the most remarkable instances I ever came across was of a woman in the forties who had, at the

time I first met her, unprofessionally, a rather peculiar pale complexion and heavy features. She was deaf and dumb, but had been taught to speak. Some months later she was brought back from her summer vacation in a rather peculiar condition. She had had an impaction of the bowels and evidently a mild acute nephritis. The face was puffy and pale. She was dull, drowsy, and a little confused. There was polyuria, a little blood, and a few casts on microscopical examination of the urine. Was it an acute nephritis in the period of convalescence or a slow chronic nephritis? There was no elevation of the blood pressure and the eyegrounds were clear. But she had an old colloid goiter which, according to the history, had begun to diminish in size about six years before, and when one considered the whole picture it seemed clear that it was an instance of myxedema with a mild acute nephritis. She made a perfect recovery with thyroid treatment and continued to take small doses of thyroid for sixteen years, dying only last year.

One occasionally meets with very acute cases in the young. I had the good fortune to recognize the first case that came to the Johns Hopkins after the introduction of the treatment. Dr. Osler had had a case of cretinism. One of my associates in the Out-Patient Department reported to me that an old patient had turned up in a remarkable condition, evidently with acute nephritis. She was dull and confused mentally, and her thyroid was practically impalpable. The face was pale, puffy and the appearance was altogether that of a nephritic, but there was no demonstrable edema. Under treatment she made a perfect recovery and so far as I know is now alive, taking, however, about a grain of thyroid a day.

The last case that I will speak of was of characteristic typical pellagra in a patient with typical myxedema. She remained perfectly well after treatment and died a few years afterward of some other malady.

Dr. King (closing).—The method used in obtaining these results was that of carbon-dioxid collection. In establishing my normal standards I measured the carbon-dioxid elimination per square meter of body surface per hour on seventeen normal men in two decades. With this figure as a start I calculated the expected carbon-dioxid elimination for various ages in the two sexes from the curve of Aub and DuBois. Having done this, I found that these figures were approximately 2 per cent below the observations from Benedict's laboratory. I arbitrarily chose the average of these two sets of figures as my normal standards; they are therefore about 1 per cent below Benedict's figures and about 1 per cent above the figures plotted upon the curve of Aub and DuBois.

The reason for the discrepancy of the age figures in our series and in Dr. White's experience is that our figures were obtained in a clinic which does not admit children.

My experience has been that in the early stages of hypothyroidism when the general condition of the patient is good there is apt to be a reduction in both pulse and temperature. It is not uncommon, however, as the condition persists for a tachycardia to develop probably due to degenerative changes in the myocardium. I believe that such strictly cardiac tachycardia in certain cases brings up the general average of pulse rates to the figures I have quoted. The patient in our series who had the lowest basal metabolism had a pulse rate of 80 per minute.

A low basal metabolism is to be expected in pituitary insufficiency. There happened to be only one such case in our series.

A SURVEY OF THE INTESTINAL PARASITES FOUND IN THE TERRITORY SUPPLIED BY ST. THOMAS HOSPITAL, NASHVILLE, TENNESSEE*

By J. A. AND JACK WITHERSPOON, M.D.,
Nashville, Tenn.

The prevalence of hookworm disease in the South was first impressed on us by the survey conducted by the Rockefeller Commission. This work conducted in Tennessee in conjunction with the Tennessee State Board of Health disclosed a high percentage of infection in certain mountain counties and eastern sections contiguous to Nashville. While hookworm disease was particularly sought for and treated, other intestinal parasites were frequently encountered and there was a renewed interest in this group of diseases.

Before the time of this investigation tapeworm disease was suspected when the patient brought in segments of the tapeworm passed, and round worm when a child picked his nose or gritted his teeth. Suitable treatment brought exciting results, but no effort was made to find other cases or correct the cause of the infections. Amebic dysentery was suspected only in those who had recently visited the tropics and who were having a marked diarrhea with blood in the stools.

The reports of the several groups working in the Southern states stressed the importance of the economic loss due to these diseases, also the great numbers of these cases in this territory.

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*Read in Section on Medicine, Southern Medical Association, Seventeenth Annual Meeting, Washington, D. C., Nov 12-15, 1923.

Amebic dysentery was probably spread in this territory by soldiers returning from Cuba and the Philippines after the Spanish-American War. Dr. J. A. Witherspoon has reported cases constantly since that time.

In our office for several years a routine stool examination has been done on those showing anemia and on adults with unexplained diarrhea.

The finding of intestinal parasites from certain localities has been so frequent that patients from those localities are suspected of having intestinal parasites even though their complaint and symptoms point to some other disease.

The diagnosis is made in the office by stool examination after giving the patient a saline purge, and when Ameba histolytica is found hospital treatment is insisted upon.

In the last three or four years the flagellate group of parasites has come into the limelight. Only recently has it been accepted with exceptions that the trichomonas and lamblia are pathogenic parasites.

Because of the reports from the laboratory that only a few men in St. Thomas Hospital staff seemed to be encountering intestinal parasites in their practice we were encouraged to attempt this survey, especially in regard to the pathogenic types of ameba and flagellate protozoan parasite. The plan of the survey was this:

It was arranged with the hospital that a routine stool examination be done on each admission just as the routine urinalysis and blood count are done, without added cost to the patient.

The nurses and attendants were instructed to send immediately to the laboratory stool specimens, especially after the first purge, was given the newly admitted patient. These specimens were transferred to a two-ounce wide-mouth bottle, stoppered and labeled. They were not put in a pan of hot water, but were carried directly to the laboratory and put in an incubator to await examination. Examinations were done as rapidly as possible and charted with the date, patient's name, hospital number, type of parasite, and a space left for the diagnosis as finally entered on the chart.

This plan should have given us a fair index as to the percentage of parasitic infections, but for various causes it fell short. Out of 1619 admissions in this period, January 1-April 30, we were able to get in the laboratory suitable specimens from only 375 patients. Of this number with feces examinations, 73, or 19.5 per cent, were positive for parasites on fresh preparation. We are sure that the use of any concentration method on examination would materially increase this number of parasites, as only fourteen patients showed ova on fresh preparation. As it was we discovered: 3 cases of strongyloides, 2 of dwarf tapeworm, 2 of whipworm, 3 of hookworm, and 7 of roundworm.

The parasite found most frequently was Ameba histolytica. Of our cases 48, or 12.8 per cent, showed pathogenic amebae.

Next in frequence was the flagellate group. These were classified into three types: Chilomastix, Trichomonas intestinalis and Lamblia. Thirty-two patients showed one or more types of flagellates. There were 4 cases of Chilomastix, 26 of Trichomonas intestinalis, and 10 of Giardia, or Lamblia.

The patients in whom these parasites were found were admitted for all kinds of diseases. Only eleven of the 73 positives were sent to the hospital because of intestinal parasitism, as was shown in the final diagnosis on the chart.

Fourteen had appendicitis, four had gall stones and four had gastric ulcer.

Most of these patients received successful treatment for their intestinal parasitism while still in the hospital, and we feel safe in saying that this has added materially to their recovery and hastened their return to health and to work.

CONCLUSIONS

Of the patients admitted to St. Thomas Hospital 19.5 per cent show some form of intestinal parasitism.

Of these admissions 12.8 per cent have pathogenic amebae in their intestinal tracts.

		POSITIVE INTESTINAL PARASITES	Flagellates										
			Ameba	Chilomastix	Trichomonas	Giardia Lamblia	Strongyloides	Dwarf Tapeworm	Whipworm	Hookworm	Roundworm	Blood	Mucus
4	Mrs. D.	Cercomonas intestinalis diarrhea	•		•	•						•	•
11	Mr. M.	Acute appendicitis	•										
13	Mr. W.	Infection of right knee	•	•									
16	Mr. G.	Suppurating wound left forearm c sinus	•										
20	Mr. A.	Osteomyelitis of tibia	•		•								
39	Mrs. N.	Laceration of cervix and perineum. Endometritis				•							
41	Mr. J.	Laceration of scalp. Bruising right shoulder	•										
45	Mr. R.	Stricture of urethra	•										
47	Mr. W.	Granuloma inguinalis buttock	•		•	•				•	•		
49	Mr. C.	Right indirect hernia			•								
50	Mr. R.	Hypertrophy of prostate			•	•							
51	Mr. C.	Pernicious anemia			•								
55	Dr. B.	Diabetes and phlegmon of upper lip		•	•								
59	Mr. J.	Ulcers on out surface of left leg. Syphilis	•										
69	Mr. C.	Interval appendicitis						•			•		
70	Mr. C.	Cercomonas intestinalis			•								
74	Mr. B.	Subacute appendicitis	•		•	•							
85	Mr. K.	Acute retention of urine. Enlarged prostate	•		•	•							
86	Mrs. B.	Amebic dysentery. Secondary anemia	•		•	•							
94	Mr. F.	Gastric ulcer c. Amebic dysentery	•										
104	Mrs. F.	Chronic infection of tonsils			•								
109	Mr. T.	Empyema (streptococcus) right	•				•						
112	Mrs. B.	Laceration of cervix and perineum. Chronic Salp	•										
116	Mrs. F.	Gall stones	•										
118	Mrs. S.	Ventral hernia	•										
119	Mr. B.	Ptomain poison	•										•
122	Mr. D.	Acute appendicitis			•								
127	Mrs. K.	Tumor breast	•										
130	Mrs. P.	Acute appendicitis and cholecystitis			•								
132	Mrs. C.	Chronic appendicitis	•										
136	Mrs. G.	Appendicitis	•										•
143	Mrs. S.	Left inguinal hernia			•								•
147	Mrs. N.	Acute appendicitis			•								
150	Mr. S.	Acute appendicitis			•	•							
185	Mr. D.	Amebic dysentery	•										•
193	Mrs. C.	Neurasthenia of pelvic origin	•										
197	Mr. B.	Gunshot wound of right ileac region								•			
204	Mrs. E.	Appendicitis	•										
218	C. S.	Subacute appendicitis	•									•	•
221	Miss P.	Subacute appendicitis					•						
226	Mr. C.	Gall stones c. Cholecystitis and aortic insufficiency	•		•	•							•
228	Mr. J.	Sarcoma of right breast	•										
232	St. M. A.	Adenoma of thyroid	•		•								
243	Mr. H.	Acute gangrenous appendicitis			•	•					•		
245	Mr. M.	Contusion of muscle of back	•										
246	Mr. O.	Amebic dysentery	•										
252	Miss C.	Slight concussion and laceration of back of head	•							•			
257	Mr. W.	Ameba and gall bladder disease	•			•						•	
260	Mr. C.	Carcinoma of eye	•										
265	Mr. Mc.	Acute gangrenous appendicitis									•		
278	Mr. W.	Parasitic dysentery and gall bladder disease	•	•									
280	Mrs. M.	Chronic appendicitis and retroversion of uterus	•										
284	Mr. S.	Arthritis of right knee. Traumatic gunshot								•	•		
285	Mr. H.	Accidental wound of right arm caused by glass	•										•
290	Mr. S.	Hypertrophied prostate	•										•
291	Mr. H.	Osteomyelitis of small tarsal bones of left foot							•		•		
303	Mr. S.	Pneumonia	•										•
308	Mr. L.	Patient had Strongyloides a year ago; returned for treatment	•	•			•	•				•	•
334	Mr. G.	Right inguinal hernia			•	•						•	•
336	Mr. L.	Appendicitis	•										
342	Dr. F.	Gastric ulcer			•							•	
344	Mrs. C.	Ovarian cyst			•							•	
351	Mr. B.	Fracture of tibia	•		•								•
353	Mrs. C.	Hyperthyroidism, duodenal ulcer and cholecystitis			•								•
354	Mr. M.				•	•							
357	Mr. B.	Appendicitis	•								•		•
360	Mrs. B.	Urethritis and amebic dysentery	•										
366	Mr. T.	Hernia	•										
372	Mr. E.	Infected hand	•										
375	Mr. W.	Cholecystectomy			•								
376	Mr. P.	Cellulitis of left arm	•										

Eight and one-half per cent have flagellates.

We wish to give Miss Mary E. Felhaus, Laboratory Technician at the Hospital, credit for her valuable aid in the detection and differentiation of these parasites.

In identifying Chilomastix, Trichomonas and Giardia the description of Reed and Wyckoff (*Medical Clinics of North America, September, 1922*) was used.

ST. THOMAS HOSPITAL—FECES REPORT FROM JANUARY 1 TO APRIL 30

Number of patients admitted to hospital, 1619.
Number of patients examined, 375.
Number of patients with positive parasites, 73, or 19.5 per cent.
Positive ameba, 48, or 12.8 per cent.
Positive flagellates, 32, or 8.5 per cent.
Chilomastix, 4.
Trichomonas, 26.
Giardia, 10.

DISCUSSION

Dr. K. M. Lynch, Dallas, Tex.—The report of the prevalence of this condition is not greatly disproportionate to reports of similar studies in other parts of the country. There is some difference in the proportion of percentages of different kinds of parasites studied. Dr. Witherspoon leaves me a bit hazy on the question of the amebae in this series. I have become firmly convinced that no one can positively differentiate the amebae in the active state. They can only be positively identified in the encysted states where the number of nuclei may be counted. Even the time-honored feature of finding red blood cells no longer means as much to me as it did formerly. I have recently had amebae, with eight-nucleated cysts, which would ingest red blood corpuscles. Consequently we have to abandon that as a positive means of differentiation. An ameba with eight-nucleated cyst under one condition will be, in the active stage, like Endomeba coli; under another condition it will be like Endomeba dysenteriae. In the active stage they cannot be positively differentiated, and that must raise the question as to whether this 12.8 per cent of amebae in this series are pathogenic amebae or not.

We recognize that Endomeba dysenteriae is a pathogenic ameba and that Endomeba coli is not, and the others are subject to debate. Consequently it is largely a matter of opinion as to whether or not they are pathogenic. It is not sufficient to examine the purged stool. Routinely we ask for a fresh, warm purged stool and if it contains active amebae we call for a formed stool in order to get the cysts. Anybody can count the nuclei of an ameba cyst, whereas there are comparatively few people who should even attempt to differentiate these two active amebae.

Dr. S. K. Simon, New Orleans, La.—Dr. Witherspoon's survey confirms the findings of other men who have undertaken a survey of the intestinal parasites, especially in the South. When you consider that Caffoid during the war in the examination of healthy soldiers found a 9 per cent amebic infection with no diseased condition apparent, you will better understand that any survey of hospital material will tell us how very prevalent the infection is in the South.

I want to take issue in a very mild way with some of Dr. Witherspoon's statements: one is the examination of the stool only after giving a saline purge. We have found, as Dr. Lynch has also intimated, that the safest method of diagnosing intestinal parasites is by means of locating the encysted forms in the stool. I can quite agree with Dr. Lynch that differentiation of the amebae is difficult. In the active stages, however, the finding of the cyst is a quite simple matter and affords a very facile means of differentiating the two organisms.

In regard to the pathogenicity of the organisms, of course, the last word has not been said. There are only two absolutely proven pathogenic protozoae. I think the pivotal point is whether the organisms are able to penetrate the tissues. We know that the flagellates particularly do not penetrate the tissues and I am entirely unconvinced up to the present time that the flagellates are actually a disease-producing organism. In my experience the finding of these comparatively harmless organisms means merely that they are finding a suitable habitat in the liquid stool.

Dr. Witherspoon (closing).—My object was to try to impress on our doctors that this infection is very great in the South. Many of these cases are being missed, and I wish to let them know that they are there. It is immaterial to me whether the parasites float in the intestinal soil or where they are. We have actual intestinal parasitic infection in the South. It is my desire to impress on this house that unless you awaken to it the infection will grow and become a menace. In the findings of the parasites we have always taken into consideration symptoms and physical signs and given them a place in our diagnosis.

TROPICAL DISEASES AND PUBLIC HEALTH

EXPERIMENTS IN THE TREATMENT OF HOOKWORM DISEASE WITH CARBON TETRACHLORID AND ASCARIDOL*

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The experiments here reported were carried out on the Fazenda Santa Luiza between October 31 and November 22, 1922, with the purpose of studying the anthelmintic efficiency of a combination of carbon tetrachlorid and ascaridol administered in proportions differing from those used in previous investigations. There were two series of experiments:

(1) To one group of persons a mixture of carbon tetrachlorid and ascaridol (0.75 mils of ascaridol and 1 mil of carbon tetrachlorid) was administered in a single dose and a purge of magnesium sulphate was given half an hour later.

(2) To a second group a dose of 0.75 mils of ascaridol was administered, followed in half an hour by a 1 mil dose of carbon tetrachlorid. A purge was given immediately after the carbon tetrachlorid.

We observed two cases of intoxication in these series, one in each group. For this reason we did not carry out a third experiment in which we had planned to administer a dose of 3 mils of carbon tetrachlorid in absolute alcohol. The cases of intoxication rendered our investigations very difficult, for they frightened the other patients so that some of them refused to continue treatment. Nine persons withdrew from the first group and four from the second group.

FIRST GROUP OF EXPERIMENTS

Twenty persons were included in this group. Those over fifteen years of age received as a trial treatment 1.75 mils of a mixture of ascaridol (0.75 mils) and carbon tetrachlorid (1 mil). Children between the ages of twelve and thirteen years received I mil of the mixture, and children between fourteen and fifteen years, 1.5 mils. The drug was administered in gelatin capsules in one single dose and a saline purge of magnesium sulphate was given half an hour later.

The average number of hookworms harbored by the members of the group was 87.9 per case. The trial treatment removed 94.5 per cent of all the hookworms. The percentage of necators removed was 97.6 and the percentage of ankylostomes, 71.0. Five persons, or 25 per cent of those receiving the treatment, were cured. In two cases, or 10 per cent of the group, treatment was unsatisfactory: that is, ten or more worms remained after treatment. Of twenty-eight ascarides harbored, sixteen were removed by the trial treatment.

The treatment caused very little discomfort. A few toxic symptoms, such as tingling of the hands, dizziness and burning in the stomach were reported. These symptoms were very slight, however, and disappeared immediately after the bowels had moved well. One somewhat severe case of intoxication occurred, a detailed report of which is given on next page. We attribute the intoxication to the action of carbon tetrachlorid, for it is well known that the symptoms observed in cases of intoxication by ascaridol are of a different nature. Furthermore, the symptoms in this case were very similar to those observed in three other cases of intoxication where only carbon tetrachlorid had been administered. We believe that this drug is responsible for the late appearance of a persistent headache, which is generally observed in the morning or the afternoon of the day following treatment and which may be severe. The cases of intoxication exhibit a headache as their first symptom. The other symptoms appear later.

SUMMARY OF RESULTS OF TREATMENT, FIRST GROUP

Number of persons treated	20
Average dose of mixture of carbon tetrachlorid and ascaridol administered as trial treatment, mils	1.41

*Ascaridol is the active anthelmintic principle of the oil of chenopodium.

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Average number of hookworms per case	87.9
Per cent of all hookworms expelled by the trial treatment	94.5
Per cent of ancylostomes expelled by the trial treatment	71
Per cent of necators expelled by the trial treatment	97.6
Per cent of cases cured by the trial treatment	25.0
Number of relative failures (cases harboring ten or more hookworms after the trial treatment)	2
Per cent of failures	10.0
Total number of ascarides expelled	28
Ascarides expelled by the trial treatment	16

SECOND GROUP OF EXPERIMENTS

The members of the second group, twenty-eight in number, received a dose of ascaridol followed in half an hour by a dose of carbon tetrachlorid and a purge of magnesium sulphate. Adults received 0.75 mils of ascaridol and 1 mil of carbon tetrachlorid. For children up to twelve years of age the dose was 0.5 mils of ascaridol and 0.75 mils of carbon tetrachlorid; for those from thirteen to fifteen years the dose was 0.5 mils of ascaridol and 1.0 mils of carbon tetrachlorid. Those over fifteen years of age received the adult dosage.

The patients of this group had an average of 170 hookworms per case. The trial treatment removed 94.3 per cent of all hookworms harbored, 98.3 per cent of necators, and 22.4 per cent of ancylostomes. Seven persons, or 25 per cent of those treated, were cured. Treatment was unsatisfactory in nine (32.1 per cent) of the cases. The twenty ascarides harbored by these patients were all removed by the trial treatment.

The toxic symptoms noted in the persons of this group were similar to those observed in the first group. There was one severe case of intoxication, which is reported in detail on this page.

SUMMARY OF RESULTS OF TREATMENT, SECOND GROUP

Number of cases treated	28
Average dose of ascaridol administered as trial treatment, mils	0.64
Average dose of carbon tetrachlorid administered as trial treatment, mils	0.91
Average of the doses of carbon tetrachlorid and ascaridol administered as trial treatment, mils	1.56
Average number of hookworms per case	170
Per cent of all hookworms expelled by the trial treatment	94.3
Per cent of ancylostomes expelled by the trial treatment	22.4
Per cent of necators expelled by the trial treatment	98.3
Per cent of cases cured by the trial treatment	25
Number of relative failures (cases harboring 10 or more hookworms after the trial treatment)	9
Per cent of failures	32.1
Total number of ascarides expelled	20
Ascarides expelled by the trial treatment	20

REPORT OF TWO CASES OF INTOXICATION CAUSED BY THE ADMINISTRATION OF CARBON TETRACHLORID

Case I.—The case of intoxication occurring in the first group of patients was that of Angelina Rano, a Brazilian girl, white, 18 years of age, and unmarried. She stated that her father and mother were alive and well and that the eight children of her family were well and strong.

Past History.—The patient was sick a year before, at which time she suffered from headaches, fever, and jaundice. The jaundice persisted for several months, but disappeared completely more than three months before our experiment. From that time on she had felt quite well. She had had a parotisis for some weeks prior to her treatment for hookworm disease. The right side of the face was somewhat swollen at the time of our first visit.

Present Illness.—On November 3 she took a dose of 1 mil of carbon tetrachlorid and 0.75 mils of ascaridol. Half an hour later she was given a saline purge of magnesium sulphate which caused several bowel movements. As she felt no symptoms at that time, she was permitted to take some light food. In the afternoon she developed a slight headache, but ate as well as usual at dinner. The headache, however, became worse, continuing throughout the night. It was accompanied by fever and general pains in the body. Next morning the headache was still severe and intense pains continued in the lumbar region and throughout the body. The patient was nauseated and vomited twice about 10 a. m.

Physical Examination.—The patient was a well-developed young woman of healthy appearance, who seemed to suffer greatly. The epigastric region was very sore, as was also the inferior border of the liver. The renal region was painful to palpation and percussion. The pulse was full, 104 pulsations in one minute, and the temperature was 37.5 degrees Centigrade. The total amount of urine passed in 24 hours (November 4-5) was 300 mils. It contained slight traces of albumin. We did not examine the urine for biliary pigments, but its appearance was suggestive of their presence. On the afternoon of November 4 the temperature went up to 39.8 degrees Centigrade, and the pulse to 100. Next day the patient's condition was serious. In the morning the temperature was 38.5 degrees, and in the afternoon it rose to 40 degrees. The pain continued intense.

On November 6 all the symptoms became

milder: the diuresis increased, the pains in the body almost disappeared, and the headache was less severe. The temperature was 37.5 degrees Centigrade in the morning. It was not taken at night.

On November 7 the patient woke up free from fever, headache, and bodily pain. She got up on November 8, although she felt very languid and weak.

Case II.—Jose Queriao, the patient in Group 2 who suffered from intoxication, was an Italian colonist, aged 37 and married.

Past History.—The man had always been strong and was hardly ever sick. He was a chronic alcoholic and had been seen several times in a state of intoxication.

Present Illness.—On November 6 the patient received one dose of 0.75 mils of ascaridol. Half an hour later he took 1 mil of carbon tetrachlorid followed immediately by a purge of magnesium sulphate. He did not feel any symptoms on the day of treatment nor on the next day (November 7) until after dinner. He then felt unwell, had some headache, was nauseated, and vomited all he had eaten. He went to bed and during the night vomited again several times and suffered intensely from headache and pains throughout the body and in the joints. We saw him the next day (November 8).

Physical Examination.—The patient was tall, well-developed, and of healthy appearance. His pulse was 66, was full and regular, and his temperature was 37.5 degrees Centigrade. He complained of headache, of pains all over the body, principally in the legs, and of severe pain in the epigastric region.

His liver was not enlarged to palpation, but the inferior border was sore, the pain being most marked over the region of the biliary vesicle. The renal region was very tender to palpation and percussion. The patient had not passed any urine during the night, but at our request he passed 20 mils of dark urine, greenish yellow in color, in which the nitric acid test revealed the presence of large amounts of biliary pigment and marked traces of albumin. No blood corpuscles were found even after centrifuging. We could not measure the total amount of urine passed in 24 hours, for the patient did not collect it as we recommended. The condition of the patient was the same in the afternoon. His temperature was 38.6 degrees.

On November 9 his general condition was about the same. His temperature was 37.5 degrees and his pulse 52. The urine still contained biliary pigment and albumin. There was noted a general greenish yellow color of the whole body, principally in the sclerae, where the jaundice was rather marked.

On November 10 he had no fever. His temperature was 36.8 degrees Centigrade, his pulse 60. The jaundice was more marked. It did not disappear altogether until the end of a week. The patient was very languid, and the epigastric pain had not entirely disappeared aften ten days, when we saw him for the last time.

CONCLUSIONS

(1) A mixture of carbon tetrachlorid and ascaridol, in a maximum dose of carbon tetrachlorid, 1 mil, and ascaridol, 0.75 mils, removed 94.5 per cent of the hookworms harbored by a group of twenty patients. A dosage of 0.75 mils of ascaridol, followed in half an hour by 1 mil of carbon tetrachlorid, removed 94.3 per cent of the hookworms harbored by a group of twenty-eight persons.

(2) Carbon tetrachlorid is well tolerated by the great majority of persons in doses up to 3 mils, which is the maximum dose we have used.

(3) In some persons the ingestion of this drug, even in small doses (1 mil), produces symptoms attributable to a lesion of the liver. These symptoms may even be those of acute toxic jaundice.

(4) Four of the five cases of intoxication which we have noted following the administration of the drug were observed in chronic alcoholics, two of whom showed evident signs of hepatic cirrhosis. (These two cases, observed in a previous experiment, have been reported by Smillie and Pessoa.[1]) However, we have treated several other alcoholics who did not show any symptoms of intoxication.

(5) We can draw no conclusions from one case of intoxication in a non-alcoholic patient. Further careful experiments under hospital conditions are advisable.

(6) Considering that most persons bear the administration of carbon tetrachlorid well but that some persons, such as chronic alcoholics, are susceptible to even very small doses of this drug, it may be advisable in future experiments to exclude the latter class of persons from treatment with the drug. In suitable cases the carbon tetrachlorid could be administered in larger doses (2 to 3 mils) with ascaridol in doses of 0.5 mils to 0.75 mils. Such treatment would probably be sufficient to cure. The contraindicated cases might be treated with chenopodium

1. Treatment of Hookworm Disease with Carbon Tetrachlorid. American Journal of Hygiene, January, 1923, vol. 3, pp. 35-45.

oil or ascaridol, in accordance with the standard method.

7. To establish this method of treatment on a solid basis we believe that the following studies are necessary:

(a) Investigations should be made under hospital conditions to determine what cases are susceptible to carbon tetrachlorid, establishing exactly the contraindications to its use and the clinical symptoms of intoxication by the drug.

(b) In the field (1) carbon tetrachlorid should be administered to children to determine the effective non-toxic dose. This may also be done in school or hospital. (2) In cases of chronic or acute malaria minimum doses of carbon tetrachlorid should be administered to determine whether the presence of this infection contraindicates the use of the drug. (3) The anthelmintic efficiency of larger doses of carbon tetrachlorid (2 to 3 mils) in association with a dose of 0.5 to 0.75 mils of ascaridol should be investigated.

(NOTE.—Preference may be given to carbon tetrachlorid in 1 per cent alcohol, for this solution, according to information received from the Wellcome Laboratories, prevents the formation of "carbonyl chlorid," which is a toxic substance.)

OBSERVATIONS ON THE WASSERMANN TEST*

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Every physician, old or young, of metropolis or hamlet, should not only understand the underlying principles of the Wassermann test, but be able to interpret and apply its results intelligently. What is actually known about the Wassermann test is very simple, and its practical application a matter clear and exact.

In nearly 100,000 Wassermann tests done for the physicians of South Carolina at the South Carolina State Hygienic Laboratory too many specimens have been sent in improperly taken or in insufficient amount. Little or no attention has too often been paid to conditions that might lead to false reactions. Too much faith is pinned to a negative reaction and too much to one that is only weakly positive. Too much reliance is placed on the laboratory test alone and too little time spent on a thorough clinical examination. Too many specimens of blood only are sent in, to the great neglect of spinal fluid specimens, which should be taken sooner or later in every case of syphilis. Of the last 35,000 Wassermann tests at the South Carolina State Hygienic Laboratory only 250 were of the spinal fluid. The public is being educated concerning syphilis, but too many physicians are lagging in the rear of modern progress, turning their syphilitic patients loose with little more than a cure of the visible signs of the disease.

The Wassermann test holds up better than any other laboratory test, but it must be reliably performed and intelligently interpreted. Every physician should know that certain conditions and factors, many of them under his own control, cause false or misleading reactions.

Misleading Reactions.—(1) Ingestion of alcohol, whether as a beverage or as an alcoholized medicine, within twenty-four hours of blood withdrawal often causes a false negative reaction.

(2) Blood taken during ether or chloroform anesthesia or shortly after may show a false positive reaction.

(3) Bacterial contamination of the blood specimen may change a positive to a negative and vice versa.

(4) In cases of known syphilis sudden changes in reaction from positive to negative and from negative to positive occur without any relation whatever to treatment.

(5) Yaws and tuberculous leprosy may give a false positive, but for practical purposes in this country these two diseases can be generally disregarded.

(6) With a positive Wassermann test reliably performed and with the proper precautions taken, there is little likelihood of going astray in the diagnosis of syphilis, but with a negative reaction the physician has to be particularly and constantly alert. The following types of syphilis may give a negative reaction:

(a) Primary syphilis, usually during the first two weeks.

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*Read in Section on Public Health, Southern Medical Association, Seventeenth Annual Meeting, Washington, D. C., Nov. 12-15, 1923.

(b) Some cases of secondary syphilis.

(c) Congenital syphilis in children, often in the first four or five months.

(d) A large percentage of neurosyphilis and of latent and tertiary syphilis, including late active cutaneous syphilis, cardiovascular lesions, vascular eye affections, abortive and late degenerative types of tabes, terminal stage of paresis, syphilitic epilepsy, cerebral gumma, and syphilitic psychoses.

Lesions of the central nervous system with both vascular and neural involvement may show a negative reaction of both the blood and the spinal fluid or of only one or the other. With only a neural involvement of the central nervous system, the blood is always negative and the spinal fluid itself often negative.

(7) Some Wassermann specimens contain certain anticomplementary substances that vitiate the results of the test. This occurs usually from contamination or hemolysis of specimens, due to lack of proper precautions. However, with all precautions observed, diabetic and other chylous blood, sera of new-born infants, and sera of certain cases under anti-syphilitic treatment are often anticomplementary and cannot be satisfactorily tested.

Interpretation.—It is only when the physician has an intelligent understanding of the principles, the meaning, the difficulties, and the limitations of the Wassermann test that he will be able to use and interpret the test properly. With such understanding he will avoid all conditions that might bring about misleading reactions. He will learn that a moderately positive or doubtful reaction is not sufficient for diagnosis unless backed by strong clinical points, and that in such cases the test should be repeated until a definite reaction is established, if possible. He will learn not to accept any single reaction, be it positive or negative, which is against his clinical judgment of the case until repetitions have proved or disproved that the reaction is right and that he is wrong. He will understand what value to place on the test as a therapeutic guide. He will learn that a negative reaction obtained in the course of treatment means very little unless the treatment has been thoroughly adequate, and that examination of blood to determine the effect of treatment gives little reliable information until at least one to three months after the last treatment.

A continuously negative Wassermann reaction of both blood and spinal fluid with an absence of all signs of activity of the disease for a period of two years after the cessation of adequate treatment may be regarded in general as a reasonable standard of cure.

The physician will not, however, keep on indefinitely pumping arsphenamin beyond all reasonable limits into late cases of syphilis in the hope of getting a negative reaction. There seem to be numerous so-called Wassermann-fast cases due to infection of the central nervous system or to small focal lesions in the aorta, heart, or other viscera. A symptomatic cure at least is possible in these late and Wassermann-fast cases, even though the Wassermann reaction may still remain positive. After adequate, energetic treatment has been given in these cases without achieving a serologic cure, it seems that further intensive treatment is no longer required and that they need only occasional short courses of treatment thereafter over a number of years, perhaps for the remainder of their lives, to prevent manifestations of syphilitic lesions.

The Spinal Fluid.—Examination of the spinal fluid in syphilis is being inexcusably neglected by physicians everywhere. It is believed that the central nervous system is very frequently involved by an active syphilitic process during the early period of generalization and that the spinal fluid changes precede by many years the clinical signs and symptoms of neurosyphilis. Inasmuch as probably 25 to 30 per cent of all cases of secondary syphilis develop infection of the central nervous system under the inadequate examination and treatment that are unfortunately and inexcusably too general, and in view of the fact that examination of the spinal fluid may often show, even in the early stages of syphilis, a beginning neurosyphilitic process in the absence of clinical evidence, it is of the greatest importance that the physician should regard every syphilitic, no matter how early the stage, as a poten-

tial case of neurosyphilis. Unless spinal puncture is employed in every case of syphilis and the spinal fluid examined, many patients will be discharged as cured who will certainly later develop neurosyphilis. If the physician does not feel competent to make a lumbar puncture, he should send his patient where it can be done properly. In all cases of primary and secondary syphilis the spinal fluid should be examined at least after the end of the second thorough course of treatment, about six months after the infection, or earlier if indicated. In late cases without clinical neural involvement this may be deferred until after the administration of complete thorough treatment. When the spinal fluid is positive it should be reexamined yearly, and when it remains negative for one year examination every two years will then suffice.

Routine Examinations.—A considerable percentage of the entire population is affected with syphilis, estimates varying from 5 to 20 per cent. The Wassermann test should be included in every complete physical examination, just as a routine urinalysis or blood pressure observation. Unsuspected positive reactions in supposedly healthy persons vary from 0 to 10 or 20 per cent, race, environment and social status being important determining factors, towns and cities showing a higher percentage than rural districts. With the finding of a positive Wassermann test in unsuspected cases incipient nerve, vascular, and visceral lesions may be detected in time to derive the greatest benefit from appropriate treatment. In surgery there are so many obscure conditions calling for diagnosis that it is remarkable that so little use is made of the Wassermann test by the average surgeon. The eye, ear, nose, and throat specialists meet with innumerable conditions that may be due to syphilis. Instead of their sending in the blood of practically all their patients, as they ought to do, it is really astonishing how few tests are made for the majority of these specialists. However, more and more physicians are having the blood of every patient tested, the best neurologists, alienists, internists, dermatologists, and genito-urinary specialists in particular having adopted this method as a general routine measure.

Marriage.—The marriage of a syphilitic is a problem often confronting the physician. What stage, standard, and index of cure should be required before marriage is permissible? While there can be no rigid standard, it seems obvious that no syphilitic should marry until he has had adequate treatment, until clinical evidence of the disease has disappeared, and until the Wassermann reaction of both blood and spinal fluid has been negative for two years after the last treatment. Healthy children, however, are born to some persons who have persistent positive Wassermann reactions, and it would not always be wise to refuse consent to marriage of persons with late syphilis whose reaction remains positive after prolonged treatment. In such exceptional cases marriage may be permissible probably five years after the original infection, with freedom from all clinical symptoms for at least the last two years.

Physical examination of all matrimonial candidates as required by various states and as proposed for adoption by other states, if properly carried out with the Wassermann test included, will go far toward reducing the incidence of innocent syphilis, both conjugal and congenital, and through the urge of marriage, if for no other reason, will doubtless lead to the treatment and cure of many cases thus found infected.

DISCUSSION

Dr. H. R. Hays, Jackson, Miss.—We have conducted in the State of Mississippi an examination of the midwives who were practicing midwifery, and we found a large per cent infected with latent syphilis. I have been sending out to the county health officers or to the physicians designated by the midwives as their family physicians a request that he go over a patient presenting a positive Wassermann and see if he could determine clinical evidence of syphilis. In fully 25 per cent of the cases we received a letter from the physician that he did not find clinical evidence of syphilis, in which case we asked the physician to take another Wassermann. The physicians have seemed indifferent to tracing this out in a majority of the cases, but in a very few cases we have had a second Wassermann which proved positive, and upon further examination the patient was found to be syphilitic both clinically and serologically. To allow a woman who

has syphilis to practice midwifery is dangerous, but that only brings to our minds the number of people who have syphilis and who go unnoticed. I think we should emphasize the importance of doing a Wassermann on every patient presenting himself for clinical examination.

Another reason why we should do Wassermanns more frequently in the South particularly, is that some authorities state that the negro is infected with syphilis in at least 70 per cent of cases. I do not believe that is borne out by the examination we are conducting. Certainly it is not in our examination of negro schools and plantations. I have just finished an examination of a negro college where there were only two cases of acute gonorrhea and only one case of syphilis in some five hundred pupils examined. I do not know what latency there is, of course.

Mr. W. C. Blasingame, Montgomery, Ala.—The idea that the negro race is 70 per cent infected with syphilis is not borne out by our observations, as Dr. Hays said. We have made a test on three thousand prisoners in the last six months in Alabama. The negro women are the highest of any class, having 37 per cent of positive Wassermanns. There were only a few over two hundred women and something like two thousand negro men who ran 25 per cent positive. The white men, something over one thousand, ran 14 per cent positive. These are criminals, remember.

In our lumber camps, all over the state, I have spent a great deal of time trying to keep the population free, because that is a roving population which transmits all kinds of infection. We have made all kinds of propositions to get the saw mill companies to place the treatment within the reach of their men. In two of the large mills in southern Alabama we have given free treatment for three years. We have just finished tests in one of these and the two races ran just about the same, less than 10 per cent after three years' treatment. Of course the labor turnover is considerable, yet this is a very stable company. When we reduce the positives in such a plant to less than 10 per cent we feel very hopeful. Three years ago the percentage was over 20. We like to give this as an experience with industrial plants.

One of the large million dollar corporations in Birmingham is cooperating with us in running a free clinic which is reducing the infection very materially.

The statement was made that there is a possibility of "too many negative Wassermanns in the first two weeks." We may have negatives for the first six weeks and yet have very positive clinical signs. Certainly a negative Wassermann within the first two weeks is of little value. For the first six weeks a negative Wassermann, with any clinical evidence at all, means another Wassermann.

Another important point is that there are so many negative Wassermanns in late tertiary cases. I want to get the fact over to our doctors that a negative Wassermann in a tertiary case means "more study." Just this week a specimen came in, and with it a note saying that the patient had "chronic bronchitis," that the physician could not locate his trouble, and asking us to make a Wassermann. He had a four plus Wassermann. What would have happened if it had been negative? Yet approximately 50 per cent of such cases will give a negative.

Dr. S. W. Welch, Montgomery, Ala.—The high percentage of infections among the negro women in the jails in Alabama can be readily understood by the fact that there were only about a hundred and fifty of them, and they represent the worst element of the female negro population of the State. It would not have been unreasonable to have expected 100 per cent infection out of that class of individuals.

Dr. C. R. Stingily, Jackson, Miss.—From my experience in directing Wassermann reactions I have come to the conclusion, as was suggested by one of the essayists this morning, that there are two classes of physicians, one class which follows medicine as a trade and another which follows medicine as a profession. The administration of 606 has been quite a prolific source of income for those who follow medicine as a trade. To this class Wassermann work is frequently disappointing. I recall that once a physician came to our place on Saturday afternoon with a blood specimen and wanted a Wassermann, saying his patient lived out of town. I told him that it could not be done until Monday. He said if his patient left town he could not get him back and it meant $25 to him. He thought a minute and said, "I believe I will tell him that you say it is positive."

Some physicians seem to think that the Wassermann test is machine made: you press a button and the thing rolls out. But, on the whole, no more satisfactory laboratory test is made and it has given those physicians that understand the principles involved and the natural limitations better results than any single clinical test made in our laboratory. Physicians should have a better knowledge and understanding of the principles underlying the Wassermann technic.

A Member.—We have physicians treating syphilitics from Mississippi or Minnesota or North Carolina or some other section in Washington, D. C., or Michigan. That presents a very serious problem in the health work of any community, and it seems to me that the state ought to be instrumental in getting legislation to prevent it. California has a law which has practically driven that kind of physician out of the State, and it seems to me that something of this character ought to be done to safeguard the public against these unscrupulous men.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

SURGICAL ASPECTS OF CHRONIC INTESTINAL STASIS*

By J. M. T. FINNEY, M.D.,
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In considering the question of the surgical aspects of chronic intestinal stasis, certain considerations at once present themselves as factors of paramount importance. When one reads the very considerable literature which has accumulated, dealing with various phases of the subject, one is struck at once with the vast amount that it contains of what, for want of a better term, I feel constrained to call "bunk." So much that has been written suggests the advocate rather than the judge. So much of theory and fancy has been interwoven with so little fact that it is with great difficulty one can separate the latter from the vast mass of the former. This field seems to offer an especially fertile soil for enthusiasts and quacks. Take the writings, for instance, of my good friend, Sir Arbuthnot Lane, who is certainly nothing if not an enthusiast. He would attribute practically all the ills that human flesh is heir to, except possibly house-maid's knee, to this one comprehensive pathological process, the mother of all pathology, namely, intestinal stasis, as he calls it. Let me quote from Sir Arbuthnot's latest paper, an Inaugural Address delivered before the Physical Society of Guy's Hospital, London, October 18 last, and printed in the *British Medical Journal*, October 27, a reprint of which I have just received. The whole address is an argument endeavoring to show the direct causal relationship between chronic intestinal stasis and cancer. Says he:

"The profession is only just beginning to realize the enormous part played by the defective functioning of the gastro-intestinal tract, the consequent fouling of the food supply and the poisoning and deterioration of the tissues by septic material absorbed from the intestine.

"That we pay dearly for the luxury we enjoy in our food and habits of life is shown clearly by the fact that civilization brings in its train a very large number of diseased conditions which do not exist in those leading the simple life of the native. That these conditions are all due to acquired defects in the functioning of the gastro-intestinal tract is, in my opinion, undoubted, since they occur at once in the native when he is placed in a civilized community, and it can be shown that these diseases bear a direct proportion to the degree of civilization enjoyed."

Further on he says:

"Cancer never affects a healthy organ. In every case in which I have had an opportunity of verifying it I have found the cancer patient was suffering from chronic intestinal stasis and that the infection by cancer was an indirect consequence of this condition. If this assumption is correct, it is obvious that to prevent the development of cancer it is necessary to obviate the changes which result in the gastro-intestinal tract from the diet and habits of civilization."

In addition to cancer, he names the following diseases as having their chief, if not only, cause in chronic intestinal stasis:

"The degenerative changes in the thyroid, adrenal and other ductless glands, the heart, blood vessels, the nervous system, the eyes and ears, the kidneys, liver, pancreas, uterus, ovaries, testes, prostate, breast, fat, skin, hair, lymphatic tissue of the naso-pharynx and the gums and teeth, rheumatoid arthritis, Still's disease, tubercle, Raynaud's disease, many splenic affections, ulcerative endocarditis, gout, ulcerative colitis, many skin diseases, diabetes, etc."*

He then goes on to say:

"Our chief interest at the present time, therefore, should be to prevent the development of chronic intestinal stasis and so obviate the incidence of the several conditions that are due directly or indirectly to its presence, of which latter group cancer interests the public particularly because of its frightful mortality and the physical and mental anguish so frequently associated with it."

*Read before Southern Gastro-Enterological Association, meeting conjointly with Southern Medical Association, Seventeenth Annual Meeting, Washington, D. C., Nov. 12-15, 1923.

*Among the nervous symptoms may be mentioned intense headache, neuritis, neuralgia, sleeplessness, misery, complete mental and physical prostration, melancholia, epilepsy, disseminated sclerosis, delusions, dementia precox, etc

Could a more dreadful indictment be brought against any condition than that brought by our illustrious confrere against chronic intestinal stasis?

One can readily see how difficult it is to discuss any subject calmly with any one who deals in such extravaganzas as these and states as undoubted facts many things which have not been proven and about which professional opinion is hopelessly divided.

Another feature which impresses one in dealing with chronic intestinal stasis is the difficulty that at once confronts one in framing any definition of the condition which will be generally accepted by every one. What one person understands as chronic intestinal stasis another will not agree to. Then again, I think every surgeon's attention has been called many times on opening the abdomen, for whatever cause, to the fact of the wide variations that occur, apparently in health, in the size, length, position and general appearance of the colon. In some cases, it is found to be very short. I have met with it not over 18 inches in its entire length. Again it may be found to be several feet in length. Its lumen varies greatly in diameter. Its mobility, as well as its motility, varies markedly at times. It may have a very long mesentery or a very short one. It may be found with very loose attachments and thrown into many folds; indeed at times the whole abdomen, when opened, appears to be full of large bowel thrown into loops and folds of various size, shape and direction, so arranged in order to crowd it all into the abdominal cavity. The thickness of the wall varies greatly, but dilatation with marked thinning of the bowel walls is perhaps most frequently observed. The investing peritoneum is at times very thin and filmy. At other times it may contain dense bands of fibrous tissue running in various directions, attaching it more or less firmly to surrounding viscera and binding it down to the abdominal walls, the so-called bands of Lane, due to stress and strain, which may give rise to kinks and stricture of the intestinal lumen and consequent fecal stasis.

Most surgeons will agree that few, if any, organs in the abdomen vary within such wide, apparently normal, limits, but there will be great disagreement upon just what constitutes a pathological colon.

Then with regard to the function of the colon. What is the normal for the given individual? It is a well known fact that the normal habit of many individuals is a single evacuation of the colon in 24 hours. With others, it may be several times a day, with still others once in several days, once a week or once a month, as the case may be. Yet many of these individuals will appear to be in other respects quite normal. One is reminded of the comment of the old lady who was heard to remark that she did not understand at all how people got along whose bowels move every day. Hers moved only once a month and that almost killed her. Sooner or later in the course of this condition a colitis, more or less intense, develops, which adds greatly to the distress of the patient.

When one comes to decide as between cause and effect, in explaining the various conditions noted, again no unanimity of opinion will be found. What will be called the "cause" by one will be claimed by another as the "effect" of chronic intestinal stasis. Sir Arbuthnot Lane is the spokesman of those who think that the whole pathological picture which he describes as chronic intestinal stasis is a direct result of the effect upon the human organism of civilization and the erect posture. Other observers make out apparently as good a case against faulty habits of early life and improper diet, deviation from the so-called normal mode of living, lack of proper exercise and auto-intoxication (whatever that may mean). Mackenzie calls it "the last resort of those who having discarded the dispensation of Providence must have an explanation of some sort."

One could still further elaborate indefinitely along this line, but time forbids.

The point I wish to make is this: that at the present time the whole matter of definition, etiology, cause, effect and proper treatment of intestinal stasis is in such a chaotic state as to render impossible any definite statement upon the subject. Furthermore, the rather fanatical

frame of mind of many of the advocates of the fecal stasis idea and the proper management of it, medical or surgical, is such as to militate against any unanimity of opinion with regard to it. Among the great number of extravagant and ill-advised papers that have been written on the subject are a few of definite scientific merit. That of Dawson is one of the sanest and most recent. I think most conservative surgeons of experience will agree upon one thing, namely, that the indications for surgery in this disease, if one can speak of it as a definite clinical entity, are few and far between. Five per cent of all those supposed to be afflicted with this ailment have been conservatively estimated as the number in whom surgery may possibly be indicated. Many congenital and acquired anomalies and other pathological conditions have been loosely grouped under this one heading, some of which do not properly belong here.

As to the type of the surgical operation to be performed, a great deal depends upon the pathological condition revealed at the time of operation. If the alimentary canal is found to present definite physical, not imaginary, kinks from adhesions or bands, the division of these and the straightening out of the intestinal tube is unquestionably indicated. Where one segment of the intestinal canal, for any reason, shows a tendency to rotate upon its axis, its fixation with a few stitches should be accomplished. Where the cecal pouch has become much dilated and elongated and has really become the traditional "cesspool," effective drainage, or even rarely its complete extirpation, may be clearly indicated. Where the pelvic colon has been thrown into kinks and folds and become adherent and obstructed by adhesions, their division may be followed by relief of symptoms. Thus one may enumerate a variety of conditions, some of which are well recognized by surgeons of experience as met with more or less frequently in the course of their surgical practice. There are many other conditions which have been described by various observers which are less readily recognized. Some of them are unquestionably the figments of distorted imagination, and any attempt to treat them by operation constitutes meddlesome surgery. One fact has impressed itself very firmly in my mind in the surgery of intestinal stasis, namely, if there is present a definite demonstrable pathological lesion of the intestinal tract, surgery may offer a reasonable prospect of relief, but in the presence of no such definite lesion, surgery does more harm than good.

What we need in dealing with this question is ordinary common sense of the barnyard variety. Sanity in the application of recognized surgical principles to definite pathological conditions is sorely needed in the surgery of intestinal stasis. Very extensive mutilating operations such as have been recommended in the past, namely, complete colectomy, ileosigmoidostomy, the partial resection of the colon, and many of the "pexies" formerly so common, now fortunately going out of style, are certainly rarely indicated, and are to be performed with extreme caution and only in the face of urgent conditions, which have not yielded to correct medical measures. One cannot too strongly condemn the indiscriminate performance of such operations as these, not only on account of the technical difficulties involved and the immediate high mortality rate, but in a large percentage of cases the unsatisfactory end results. In many, relatively, of these cases the last state of the patient is worse than the first, and then irretrievable damage may have been done. That these extreme measures are indicated in a very small percentage of cases is undoubtedly a fact, but as our knowledge of this condition grows and our experience in the proper mechanical and medical management of it widens, the number of cases in which extreme surgical measures are to be employed will be found to be constantly diminishing. Another feature to which attention must be called is the psychic element in these cases. In many of them it will be found to be of the utmost importance, and association with the psychiatrist in the management of these cases will prove of great aid. An intestinal neurasthenic is one of the most intractible types, vying in malignancy with the varicocele and sexual groups.

There is another factor beside those which have been referred to and which

personally I feel plays a more or less important part in the symptom-complex of this disease, namely, the question of disturbances of the internal secretions. This is simply an impression and I have no proof with which to substantiate it. And if this impression is well founded, whether it is cause or effect, I am unable to say.

As indicating to what extremes the enthusiasts in this particular field may go, let me quote again from this same paper of Sir Arbuthnot Lane, which is the last word in intestinal stasis. After having rung the changes on colectomy, ileo-sigmoidostomy and partial resection of the colon, he appears to reject them one after another, and then has this to say in recommendation of his latest operative procedure, fortunately much more simple. After describing in detail how certain peritoneal bands of fibrous tissue are formed which bind the sigmoid to the floor of the pelvic fossa, and to which he gives the euphoneous name of "first and last kink," "first" because it is the earliest to form, and "last" because it is the lowest in the gastro-intestinal tract, he goes on to say:

"I cannot exaggerate its importance, as I believe its capacity for harm is tremendous and far-reaching, and that it is responsible for all the changes which are due directly and indirectly to chronic intestinal stasis. It spells the failure of civilization and is an inevitable Pandora's box."

With regard to the treatment of this dreadful condition, he recommends a careful freeing of the sigmoid from its acquired attachment to the iliac fossa. This should be done thoroughly and with the greatest care and any raw surfaces of mesentery must be accurately covered by peritoneum in order to obviate any recurrence. In commenting upon this particular surgical procedure, he says:

"Perhaps of all operations in surgery, this procedure alone is followed by the most wonderful effect. The whole condition of the patient is transformed and he is rapidly restored to vigorous health. After all, this is not surprising, since it is because of this obstruction that all the other changes in the gastro-intestinal tract, whether mechanical or toxic, ensue."

It would be comforting, indeed, to know at last the true pathology of this most puzzling complex condition. What a relief it would be to all concerned if this pathological process could be so satisfactorily explained, and reduced to such simple terms, and it and its multitude of attendant ills be thus swept away with a wave of the hand. But unfortunately the prosaic, matter-of-fact surgeon and the interested patient know otherwise. There is not, there cannot be, a common pathology for all of the various conditions grouped under the head of intestinal stasis. No more can a single surgical procedure provide a sure and complete relief. Many widely differing conditions are met with from time to time and each has its own particular pathology and each presents its own particular problem to be solved. This cannot be satisfactorily accomplished by a sweeping generalization, but requires careful and often long-continued study and observation, and will then not infrequently tax the resources of the surgeon to the uttermost to provide satisfactory relief. From the very nature of the trouble, the physical and mental equilibrium of this class of patient is so unstable that it offers a wonderful field for the surgical faker and enthusiast. Says Coffey, who has written a good deal upon this subject:

"I concede that in bringing forward this subject of ptosis and stasis we are opening one of the most dangerous fields for surgical abuses that has ever been opened to the surgical 'confidence man,' who needs no other excuse for performing a surgical operation than the consent of the patient."

SUMMARY

As I see the surgical aspects of this question, they can be briefly summarized as follows:

(1) Much foolishness has been written on this subject.

(2) So little is really definitely known about it at the present time that one cannot lay down any hard and fast principles either as to the etiology of the condition or as to its proper treatment.

(3) That there is such a condition is undoubted. That it is not a simple but a very complex process is equally certain. It is far less common than is supposed by some.

(4) In the surgery of this condition,

the indiscriminate employment of extreme surgical measures is injustifiable. Rarely they may be indicated.

(5) Here, as elsewhere, the best results will be secured only by the sane application of well recognized surgical principles.

UTERUS DIDELPHYS: REPORT OF A CASE, WITH SOME POSTOPERATIVE OBSERVATIONS*

By JNO. H. BLACKBURN, M.D., F.A.C.S., Bowling Green, Ky.

Miss Frances S., white, female, age 12 years and 1 month, was referred to me by Dr. W. C. Strother on April 28, 1922, the chief symptom being frequency of urination. The family history was negative. She began to menstruate the middle of June, 1921, being 11 years and 3 months old. The periods had been regular since the first appearance, but she had complained of pains and soreness in the lower abdomen with tenderness and slight swelling in the right inguinal region. The flow had been moderate and of 4 or 5 days' duration. The increased frequency of urination had been more marked for the last 2 or 3 months. An examination of a voided specimen of urine showed nothing abnormal.

At the first examination the patient weighed 100 pounds, had well developed breasts, there was marked growth of pubic and axillary hair, and these signs with the broadening of the hips and general contour of the body indicated the pubescent development of a girl two to three years older.

The physical examination showed nothing abnormal in the heart or lungs. The examination of the abdomen revealed an irregular nodular tumor in the right inguinal region which extended slightly above the anterior superior spine. Inspection of the external genitals showed a bulging of the right labia majora and minora. On introducing the index finger into the vagina which could be done with very little difficulty we found a mass on the right side of the vagina occupying the entire para-vaginal space and pressing the vagina far to the left. The examining finger could be made to encircle the mass anteriorly and posteriorly, but we were unable to palpate the cervix uteri. This mass had a fluctuant feel and while it appeared to be continuous with the mass in the right lower abdomen we were not satisfied that a wave of fluctuation could be transmitted from one hand to the other.

A provisional diagnosis of ovarian cyst was made, but the bulging into the vagina could not be satisfactorily explained in this way. Our decision was that the urinary disturbance was of a mechanical nature.

Another examination was made the following day and the study of the case in the meantime convinced us that it demanded interference at once. At the second examination following a purgative we were enabled to outline a larger globular mass low down at Poupart's ligament and extending somewhat to the left of the midline with a smaller and rather irregularly shaped mass which occupied the right half of the lower abdomen and extended up to McBurney's line. At this examination we were convinced that there was a malformation of the uterus with an accumulation of the menstrual fluid. There was no malformation of the external genitals.

Operation was performed on May 4, 1922. A median incision was made below the umbilicus. The pelvis was filled with a mass which showed adhesions of the ileum at points and the sigmoid rather closely adherent. The omentum was attached to the upper limits of the tumor on the right. On carefully separating these adhesions we found that the tumor at the right upper portion was the Fallopian tube distended to the size of the closed fist, much twisted and distorted, with the ovary spread out over its lower posterior surface, and with the appendix densely adherent over its upper surface.

Further exploration showed below this a uterus which was distended until it filled more than half the pelvis, and on searching for the left appendages we found another and much smaller uterus to the left with its tube and ovary of about normal size. The two uteri were separated from the fundus down to a point at or slightly below the internal os.

After getting our bearings we first removed the appendix from the base downward, leaving it attached to the distended tube which was then removed with its ovary. No attempt was made to save this tube and ovary because of the risk of sepsis which frequently follows a mere drainage in these cases. After this part of the operation had been completed we made a longitudinal incision on the right wall of the vagina, beginning just within the labium minus and extending longitudinally 2½ inches. This permitted the escape of 18 ounces of the characteristic retained menstrual fluid which had been accumulating for 11 months. We were then enabled to palpate and to see the two cervices which were projecting into the two vaginae, the right os of course being much dilated. The right vagina was covered by the same character of mucous membrane as the left. Unfortunately no chemical examination of the retained fluid was made. In order to prevent adhesion or coalescence of the two margins of the septum they were trimmed above and below and the margins were crushed with large forceps. The uterine cavity was then irrigated freely with a permanganate solution.

After a change of gowns and gloves following resterilization we again examined the pelvic organs and found that the right uterus was much reduced in size and exhibiting definite contrac-

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tions. The parents of the child had been informed previously as to her condition and as to the possibilities and dangers incident to marriage and child-bearing. So at the insistence of the mother we tied off the left tube by encircling it repeatedly with the ligature and folding it on itself several times. After a careful toilet of the peritoneum to see that there had been no escape of the retained fluid into the peritoneal cavity the abdomen was closed.

The immediate postoperative result was excellent, the temperature never going above 100 degrees Fahrenheit, and the convalescence was uneventful. At the end of the first week the vaginal discharge was slightly purulent for two or three days, but this was quickly relieved by the permanganate douche.

The menstrual flow appeared again on June 20, 1922, six weeks after the operation, and lasted for five days. The history of the periods up to this time is as follows:

July 18, 1922, 5 days.
August 18, 1922, 5 days.
September 15, 1922, two days.
October 19, 1922, 5 days. Weight, 137½ pounds.
November 20, 1922, 5 days.
December 22, 1922, 5 days.
January 16, 1923, 7 days; "real bad." Weight, 145½ pounds.
February 14, 1923, 5 days.
March 15, 1923, 6 days. Weight, 148 pounds.
April 11, 1923, 6 days.
May 15, 1923, 6 days. Weight, 155 pounds.
June 17, 1923, 6 days. Weight, 154 pounds.
July 19, 1923, 6 days.
August 21, 1923, 6 days.
October 1, 1923, 5 days.
November 1, 1923, 5 days.

This patient was examined by speculum on the first day of the menstrual flow in October, 1922, January and July, 1923.

At each examination both vaginae and both cervices were carefully swabbed and cleansed and in every instance the flow could be seen escaping from both uteri.

If we bear in mind the successive steps in the development of the uterus and vagina the different malformations are easily understood. The Mullerian ducts are solid strands which later develop lumina throughout their length. Fusion of the two ducts first occurs at the site of the future cervix and extends upward as far as the fundus and downward to the introitus. Above the fundus these strands become the Fallopian tubes. Between the two sides the septum formed by the fusion is gradually absorbed and there is normally formed a single uterus and vagina. The failure of fusion on the one hand accounts for the most marked occurrence of the double uterus, whereas the more complete fusion with a failure of absorption of the septum is responsible for the less marked cases of malformation.

In the case reported above we have a complete separation of the two uteri down to a point at or below the internal os. Each body had its separate tube and ovary with its round and broad ligaments. Several authors have mentioned a peritoneal fold extending from the posterior surface of the bladder to the anterior surface of the rectum, the so-called vesicorectal fold, which they believe is of embryonal origin, and to which they give an etiologic relationship. If this fold or ligament was present in our case we failed to recognize it on account of the marked difference in the size of the two bodies and the distortion of the structures.

In our case there were found two well developed cervices, each with a separate vagina. The vaginal septum was fully developed and at the introitus was fused with the right vaginal wall just within the hymen.

After the retained fluid had escaped, the left cervix and os were found to be of practically normal size for a twelve-year-old girl and there was a marked dilatation of the right os uteri, a well defined trachelometra.

As to the frequency of these malformations the older authorities considered them very rare and the text books of even twenty-five years ago described them as of slight importance and little danger.

Unless an atresia should exist with its accompanying retention of the menstrual fluid, the malformation doubtless will not be recognized until after conception occurs and probably at the time of delivery. There are at times disorders of menstruation and other symptoms referable to the pelvis that may lead to an examination with a recognition of the condition, but this is infrequent except in the presence of an atresia which in these cases may exist at any point from the hymen to the cervix.

As to the frequency of pregnancy and the dangers attending it in cases of this type, Miller has reported a case from the University of Michigan Hospital and col-

lected and studied from the literature 53 additional cases. A brief review of Miller's figures will, in our opinion, be worth while.

In the series of 54 cases, 34 were married women and of these 31 became pregnant. 91.1 per cent. He reports that one single woman in the series also became pregnant, a total of 32 cases.

In addition he quotes the cases of Pfannensteil and Giles showing that over 90 per cent of the married women became pregnant.

In 32 women in Miller's studies there were 67 pregnancies. These occurred in the right. the left and in both uteri. The site of the pregnancy depends upon the development of the uterus rather than upon its size. In cases of double vagina the pregnancy usually occurs in the uterus connecting with the larger vagina, particularly if the smaller vagina is very poorly developed.

While it has been observed that the fertility of women who have this type of malformation is not affected to any degree, yet it was found by Miller that only 28 of the 67 pregnancies, or 41.7 per cent, were delivered spontaneously at term. The interruption of the pregnancy occurs most frequently in the early months, abortion occurring in from 21 to 100 per cent of different series of cases reported in the literature. Premature labor occurred in 10.4 per cent of Miller's cases.

Of the 41 cases which went to term, only 28 were delivered normally, 13 cases, 31.7 per cent, requiring some interference such as forceps, version and extraction, or cesarean section. The causes of dystocia were enlarged nongravid half of the uterus, vaginal septum, uterine inertia, tetanic contraction of the uterus, retention complications and eclampsia.

In considering the retention of the menstrual fluid it is found that at times it is present only in the vagina or in the uterus or in the two, depending somewhat upon the length of time since the appearance of the menstrual flow. However, the presence of fluid in the Fallopian tube is not so easily explained, since it cannot be taken for granted that the blood is easily forced back from the uterine cavity into the lumen of the tube through the minute orifice of the tube. This also raises the point as to whether the tube takes part in the production of the menstrual fluid, some claiming that the tubal mucosa pours out a menstrual fluid just as does the endometrium. Some have explained the presence of the hematosalpinx as due to an inflammatory reaction or to some disturbance in the circulation in the tube. In our case there had undoubtedly been some inflammatory process as shown by the presence of adhesions between the hematosalpinx and all the surrounding structures. Another point of interest was the staining of all the tissues near the tube, the peritoneal covering of all the organs showing a muddy greenish tint.

A point of particular importance in the treatment of these cases is the manner of handling the retained fluid. In a small number of them infection has already occurred and we have to deal with a pyocolpos or pyometra. In every case the retained fluid is a most fertile field for the growth of bacteria and infection soon occurs if most rigid precautions are not taken. Quite a number of cases have been reported in which a drainage through the vagina was done and this was soon followed by a very active fatal peritonitis. The presumption is that the relief of the pressure led to a leakage of the fluid through the ostium of the tube into the peritoneal cavity. Some have advised a salpingostomy and drainage of the tube, but this treatment is questionable in view of the probability of infection and the dangers incident to pregnancy and delivery.

MENSTRUATION IN RELATION TO DOUBLE UTERUS

In these cases the menstrual flow usually is not interfered with, but it may occur every two weeks, every month or once every two months. According to Polak, in the first case the two halves are presumed to menstruate alternately and independently of each other. In the second class both sides menstruate simultaneously or each one functionates alternately every other month. In the third instance there is a bimonthly flow from one half while an atresia exists on the other side, leading to the development of a hematometra.

There have always been superstitions and theories regarding the causes of the menstrual flow, but in recent years the clinical evidence as well as the experimental investigations all indicate that the ovary with its internal secretion is the important factor in bringing on the menstrual flow. There has been much discussion and investigation as to whether the follicle, the stroma or the corpus luteum is the portion of the ovary producing the hormone.

According to Novak,

"For the present the question must be looked upon as an open one, although the weight of evidence, it seems to me, is overwhelmingly in favor of the corpus luteum as the ovarian constituent responsible for the menstrual phenomenon."

He also attributes a great influence to the other glands of the endocrine system on the function of menstruation.

In our case the menstrual flow had been present at regular intervals for 11 months, there being apparently a normal flow as to quantity from the left uterus. The quantity of fluid that had accumulated in the vagina and uterus, 18 ounces, with probably some 5 or 6 ounces in the tube, would suggest that there had been a flow every month from the right side. Novak states that the amount of blood lost each month in temperate climates is probably from 2 to 6 or 8 ounces. In any case of atresia the quantity would no doubt be less than normal.

In our case the flow appeared in six weeks and had afterward a 30 or 28-day interval with a duration of 5 or 6 days. On the three occasions on which she has been examined it has been within 24 hours of the onset of the flow. A careful cleansing of both vaginae was done and in each instance the flow was observed to be escaping from both cervices. In this case with the regular monthly appearance of the flow the two ovaries were evidently working simultaneously and since the removal of the right the left is providing the hormone which activates both uteri and leads to a normal flow from both.

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DISCUSSION

Dr. J. Shelton Horsley, Richmond, Va.—It is readily understood why such a deformity occurs. As Dr. Blackburn said, Muller's ducts, small cords which run parallel with the Wolffian ducts, are fused at the lower portion and at that loop if fusion is complete the uterus occurs. Below that there is a plug which finally opens up and forms the vagina. We can readily see that any disturbance in the crossing of these ducts in the female will cause considerable deformity. In the male they usually disappear, except for a small portion at the prostate which is a relic. Whereas in the hare-lip and cleft palate the failure of fusion leaves a deficit, in this instance it produces a double uterus. Each of these uteri may be practically complete, except that it always has only one tube and one ovary.

I have been impressed with the very firm adhesions that occur from the chocolate cysts, so-called, without any infection at all. There seem to be very dense adhesions from these hemorrhagic cysts, without the presence of infection. Often in severe infections we have no adhesions and mild infections may cause severe adhesion, and it may be the irritating effect of the non-infectious material which causes the permanent adhesions.

The gain in weight in Dr. Blackburn's case is also an interesting feature. The endocrines are blamed for so many things nowadays that we might suggest that the removal of one ovary and tube further restrained one endocrine function or secretion, either directly or indirectly.

Dr. G. T. Tyler, Jr., Greenville, S. C.—We must distinguish between defective fusion and defective development of the Mullerian ducts. Fusion occurs before the twelfth week of fetal life. In the second four weeks, the ducts join. Arrest of fusion before the twelfth week results in double uterus: after this time, in bicornate or septate uterus. If there is arrest in development in the first four weeks, unicornate uterus occurs; if in the second four weeks, unicornate uterus with rudimentary horn.

Didelphys is defective fusion: two uteri, each having its cervix and vagina. There are many degrees of incomplete fusion: septate hymen, septate vagina, atresia of the vagina. There may be two cervices, or one cervix with septate or double body, the latter called bicornate. The ovary is usually not involved in these anomalies, but the uterine ligaments, the ureter and kidney on the corresponding side may be absent or rudimentary. Maier, however, has reported one case of absence of vagina, right ovary, and right tube. Conaway reported a double uterus with absence of vagina. The condition is not rare. Up to 1910 Piquand collected 261 cases of bicornate, and 242 cases of double uterus. In reviewing the literature for the past seven years I saw reports of at least fifty cases.

It is surprising to note the number of pregnancies in patients having this condition: three, four, and in one case nine pregnancies occurred. Cornell and Earle report a bicornate uterus hav-

ing two ova in one horn. Hatfield-Jones, in a series of ten cases, reported one having four pregnancies. He attended the patient in the last two of these labors. One pregnancy was in the right, the other in the left uterus. He also calls attention to frequent menstruation during pregnancy and to the possibility of superfetation. I have noted a greater proportion of breech presentations in these cases than in normal patients.

When operation is done, after one uterus, or a rudimentary horn with retained blood has been removed, pregnancy has occurred in the remaining uterus. Therefore conservatism should be our rule in operations. I believe I would not have tied off the remaining tube in Dr. Blackburn's patient.

As to the source of blood in the tube: it may be from the uterus. It has also been found in cases where the tube was blocked off from the uterus. Hence it can come from the tubal mucosa.

Increase in weight in this patient might be caused by abnormal pituitary secretion.

I should like to call attention to our inaccurate use of medical terms. This is a case of didelphys. The word itself means "double uterus." The term "uterus didelphys" occurs in English, French, German and Italian literature. Every text book of gynecology which I consulted in preparing this discussion, Ashton excepted, had the expression, uterus didelphys. Ashton used the word "didelphys" with "double uterus" in brackets. When are we to begin using correct terms?

Dr. Joseph J. Mundell, Washington, D. C.—I wish to record here a case of true uterus didelphys, double vagina, double uterus and double cervix. I did a cesarean upon this patient on two different occasions, the first in 1921. The patient, after a normal pregnancy, went into labor with cephalic presentation. After she had been in labor and making little progress 50 hours, cesarean was done. The obstruction was due to the unimpregnated uterus' blocking the pelvis. A year later the patient again became pregnant and after a normal pregnancy went into labor with a breech presentation and I did the second cesarean even after the breech was well down in the pelvis because I was fearful that the unimpregnated uterus might obstruct the passage of the aftercoming head. True uterus didelphys is comparatively rare, but I have collected about 300 cases of pregnancy in double uterus. Because many cases have gone to labor and have been delivered normally, I doubt that it is always advisable when such condition is discovered to tie the tubes or in other ways sterilize the patient.

Dr. William Mercer Sprigg, Washington, D. C.—A patient 37 years old came in complaining of incontinence of urine. Frequently this is the only symptom these patients will have unless they become pregnant. She was under the care of Dr. Jewett, of Brooklyn, for many years, who failed to recognize the double uterus. We found the double vagina and the left vaginal opening was definite. The septum was to the left of the median line and we could slip a finger into the tract without any difficulty. She had a perfectly normal cervix on both sides. Examination would not detect the double uterus. We measured and found one two and a half, the other two and one-fourth inches in diameter. She was unmarried. Every month she had uterine pain, one month on one side and the next on the other. This was rather suggestive. For six months we watched the menstrual periods, packing both uteri. When the flow was established we found the tampons soaked on one side and dry on the other and this was reversed each month. It would seem that the hormones would affect the endometrium of both at the same time, but for some unknown reason it does not always do so.

Dr. C. P. Gray, Monroe, La.—I wish to agree with Dr. Tyler that this title is a misnomer. Doctors have a tendency as a whole to grasp at a word and use it wrongly.

Mrs. H. G., thirty-eight years old, was in the sanitarium, St. Francis at Monroe, one month before her expected confinement, on account of one and a half per cent albumin, and for the reason that we wanted to give her the benefit of hospital attention. She had been examined by me and had a normal pregnancy. She remained in St. Francis Sanitarium for five weeks. Labor developed and nothing unusual had been noted. The albumin had cleared up. Labor came on about 8 p. m. and she progressed as the average case would until 4 a. m. of the next day. At 4 a. m. the next morning on examination I found a dilated vagina and the uterus not developed normally. On examination of this patient under ether what I had thought on my previous examination was one vagina, under ether I found to be two. The vagina on the right was separate. I tried to introduce the forceps. I could run my hand up and feel the back of the baby. I tried to do a podalic version, but this was impossible, so I did a cesarean section high, delivered the baby and found a double uterus and double cervix. The patient died, I think, on the morning of the second day of acute dilatation of the heart. Autopsy showed a bicornate uterus with two vaginas.

Dr. Robert Boyd McIver, Jacksonville, Fla.—A colored female of 17 was admitted to the hospital because of obstinate constipation and chronic abdominal pain. These symptoms had existed since birth. There had been an operation shortly after birth, probably for imperforate anus. According to the history the bowels moved only once a month. The abdomen would become larger and painful during the weeks preceding defecation, but was flat and painless for a time afterward. The bowel movements continued over the period of one week once they were started.

Complete study developed a bicornate uterus in addition to vaginal septum, megacolon and perineal fecal fistula.

Dr. Blackburn (closing).—I believe it is Frankl who claims that the adhesions in the ostium of the tube are all due to infection of a mild type, and that they are not congenital. In my case I think there was a definite mild infection.

This patient's father is very adipose. He is five feet seven or eight inches tall and weighs a

little over two hundred pounds. There is no other hereditary tendency to that condition so far as I know. It occurred to me that the increase in weight which began when the child began to menstruate had continued and was probably aggravated or increased by the removal of the ovary.

As to the breech presentation, I think this is due to the non-development of the nongravid uterus in the pelvis, which makes the pelvis of the fetus descend rather than the head. This may account for the rather frequent breech presentations.

As to the tying off of the tube, I stated that I explained the condition to the mother and father. I knew that many of these cases go on to marriage and pregnancy and while some recover normally a large percentage need operative assistance that I tied off the tube. If my wife or daughter had a double uterus there would be no future pregnancy.

As to Dr. Sprigg's case and tamponing the two vaginas, what does a hormone mean? The hormone acts in the blood and stimulates the endometrium. Was his a case where the right ovary would stimulate the endometrium of the right uterus and the left ovary the left uterus? It is like looking for a boy if the ovum comes from the right and a girl if it comes from the left, or vice versa. I cannot understand this explanation. In this case of mine the flow came from both sides and in every instance the endometrium in each uterus was stimulated. Presumably one ovary, the left, worked on both uteri, so it is difficult for me to understand Dr. Sprigg's case on that basis.

THE OPERATIVE TREATMENT OF FRACTURES*

By J. S. GAUL, M.D.,
Charlotte, N. C.

The exorcise of conservatism in the operative treatment of fractures has, heretofore, been necessary because of the attendant risk and danger of infection.

The marked improvement in the operative technic advocated by Mr. Lane would seem to have enlarged the field for operative procedure. We have, however, made such marvelous advancement in the study, in the diagnosis and in the treatment of fractures by non-operative measures that I am sure I state the consensus of opinion of the members of this Section that conservatism is imperatively demanded in the consideration of any fracture.

That there is a field for operation in the treatment of fractures is equally true. It is to this class of cases that I shall largely confine my remarks, endeavoring to emphasize what competent men have, by experience, determined.

In any fracture the surgeon should make an accurate diagnosis of the type, location, position of the fragments, and complications. The general condition of the patient should receive consideration. The possibility of associated shock should be borne in mind and measures instituted to combat it.

This is most important and more particularly so when operative intervention is being considered, operation being interdicted when shock is present. In all compound fractures the administration of tetanus antitoxin is imperative.

Before operation is justified, honest, intelligent effort to obtain proper reduction by the non-operative methods, now so well developed, must be made in all cases except those in which life is threatened by hemorrhage or pressure, or in which there is evident severe trauma to important nerve trunks by the fragments of the fracture. By proper reduction is not necessarily meant perfect anatomical alignment of the fragments. Such alignment is not always necessary to obtain a good functional result.

We must be convinced that results as judged by function, cosmetic appearances and satisfaction to the patient cannot be obtained as well by non-operative means as by operative proeedure.

With the decision tentatively made to operate, factors to be considered are: age, social status, the condition of the patient, the condition of the tissue overlying the fracture, and the time elapsing after receiving the fracture.

The very young and the aged are poor operative risks. Certainly undernourished, rachitic children as well as those with syphilis, tuberculosis and hemophilia should be excluded. To operate in the aged who have cardiovascularrenal disease is to court disaster.

It is probably wiser to allow a period

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of from seven to twelve days elapse before operating to clear up infectious skin lesions and avoid possible complications of the operation with developing pneumonia, delirium tremens and tetanus.

One should be sure of his competency in operating fractures, have a rigid aseptic technic, be equipped to do the work and have proper surroundings.

The following fractures will in instances require more or less immediate operation: depressed fractures of the skull producing pressure symptoms; fracture of the vertebra with associated compression symptoms; fracture of the coracoid process of the scapula with marked displacement and loss of the fixation power of the pectoralis minor muscle upon the scapula in abduction of the arm; fractures of the upper third of the humerus with marked displacement, or with dislocation of the head, in the reduction of which we are unsuccessful; splitting off of the tuberosities of the humerus with marked displacement; fractures of the lower third of the humerus with marked lateral displacements of the fragments, or in which the external condyle has "turned turtle;" transverse supracondylar fractures which resist successful reduction; fractures into the elbow or knee joints requiring too much manipulative trauma for a satisfactory reduction; fracture of one or both bones of the forearm with divergent displacement of the fragments; fracture of the lower third of the femur with marked posterior and upward displacement of the lower fragment, or with separation of the condyles; fracture of the patella with marked separation of the fragments; depressed fracture of the sternum with associated dyspnea and cyanosis; fracture of the carpal scaphoid; fracture of the astragalus; fracture of the os calcis; of the second and third metatarsals; fracture of any bone with evident trauma to important blood vessels and nerves, and finally in compound, comminuted fractures with laceration and contusion of the soft structures.

Operation may also be demanded to bring the fragments of a fracture together; to correct deformities, such as angulation, rotation and disturbances of weight bearing; to maintain end-to-end apposition of the fragments; to remove the comminuted, fractured head of the radius; to correct non-union; loss of substance; latent sepsis and involvement of nerves in callus, notably the musculospiral and ulnar nerves. Even in these cases, we are justified in doing only that which will secure the most ideal results with the least surgical interference. In most cases an adequate incision to expose the fragments with simple reposition, when combined with proper external support, will be followed by excellent results. Necessary debridement where indicated must be done.

Where more than simple reposition is required some form of internal splinting will be necessary. It is not within the scope of this paper to argue for or against one or more of these methods. Each has its enthusiastic advocates, and in their hands gives sufficiently good and probably some poor results. The decision to use Lane plates, bone or ivory pegs or intramedullary pegs, bone grafts, silver or phosphar bronze wire, Grant's pins, step operations, absorbable material or other special methods necessarily lies with the individual operator, he being guided by his experience and limitations. We have all probably used each of these methods with good and with poor results.

Where there is loss of substance the use of an autogenous bone graft is indicated. Here, too, the surgeon will be guided by his experience in the use of any of the accepted methods of using a graft. In this connection it is advisable again to call to our attention the fact that fracture in grafts is brought about by muscle action, and therefore the external support should be applied with this in mind.

There are some intractable difficult fractures for which special methods have been devised, such as the use of Steiman's pins, Codivilla's nails, and Ransahoff's tongs for fracture in the lower third of the femur with marked posterior and upward displacement of the lower fragment; Whitman's or Bracketts' operation for ununited fracture of the neck of the femur and finally Strauss' procedure for fracture of the os calcis in which the posterior fragment is displaced upward and backward.

The discussion of a subject so broad in

such a brief amount of time must necessarily omit many points of interest.

CONCLUSIONS

(1) Conservatism, when considering operative treatment of fractures, is imperatively demanded.

(2) The least amount of surgical interference to obtain a satisfactory result is advisable.

(3) Competent surgeons only should operate for fractures.

DISCUSSION

Dr. Frank Dickson, Kansas City, Mo.—Conservatism in treating fractures has never been more necessary than at present, when we have so many more opportunities for operating than formerly. Every one has some form of internal fixation which he wishes to put on fractured limbs, and these are apt to lead us into operating upon more fractures than is necessary. The success of any form of treatment must be judged from the point of function.

In fractures, we must get away from the point of view of just the broken bone and consider the extremity as a whole. We must do what is necessary to insure result, not only on the bone, but on the surrounding soft parts if they are involved. The x-ray should be used to check up position and if we cannot obtain reduction and hold it, internal fixation should be used.

I will consider briefly just a few of the fractures of the upper extremity. Of course, fractures of the clavicle and scapula rarely need operation. All fracture dislocations should be operated as soon as possible after the tissues have reached the point where it is safe. Fractures into joints with displacement should be operated upon, for with proper technic they can be treated much better by the open method than by conservatism. Fractures of the olecranon should be treated in the open manner. The results with fracture of the olecranon are not satisfactory, and here is one fracture of the upper extremity that lends itself to open operation. In fractures of both bones of the forearm in the lower third we should get better results if we operated more frequently.

After I get into the fracture I lean towards putting in some form of fixation. I do not believe in just putting the bones in apposition. In some cases we are fortunate and succeed in that way, but I believe the safer principle is to put in some form of mild fixation. Small bone pegs cause very little reaction and are very successful in keeping the bones in apposition. We must not forget the role of proper external fixation after putting the bone pegs in. If we depend upon internal fixation only we will have many disappointments.

Dr. George E. Bennett, Baltimore, Md.—The vast majority of fractures of the neck of the femur are best treated by the Whitman method, which is conservative, but might be considered operative because the patient has to be given an anesthetic. However, there are cases of fracture of the neck of the femur in which an operation is desirable, as in instances where patients are young enough to justify an open operation with a pegging of the fragments. This represents a very small percentage of the total cases.

The fracture which gives us most concern is the fracture of the femur itself. The transverse or short oblique fractures of this bone are certainly troublesome. The long oblique fractures give us less concern, probably because muscular attachments control the fragments and form a more satisfactory splint. I believe that in all fractures of the femur at least a week or ten days should be spent in thorough traction treatment before an operation is contemplated. The more one sees of internal fixation of fractures the more one concludes that the average surgeon is a very poor mechanic. The use of wire or banding should be limited entirely to oblique fractures and plates should be the material used for transverse ones. When one applies a plate it should be sufficiently large and strong to accomplish the desired result. After healing has occurred, foreign material should be removed.

In fractures of the lower third of the femur, particularly of the knee joint, often spoken of as "T" fracture of the condyle of the femur, very early reduction is absolutely necessary if conservative treatment is of no avail and if the fragments cannot be squeezed together before the blood clot organizes between them, open procedure will be required.

Fractures of the patella can almost all be grouped into operative cases. Very poor judgment is apparent when one sees the end-results of very extensive comminuted fractures of the patella in which the surgeon has replaced every small fragment into as nearly a normal position as he can obtain. The result is that he has a patella that is at least one-third or one-half broader than normal. This condition is sure to result in the loss of some function of the knee. It is preferable to remove a number of the fragments so that the end-result gives you a patella normal in size. I prefer to purse-string the fragments with kangaroo tendon or silver wire.

Dr. Wallace Billington, Nashville, Tenn.—Malunion and nonunion are generally operative cases. A good functional result does not require perfect coaptation of fragments. Imperfect coaptation or displacement as shown in the x-ray often causes much alarm in the mind of the surgeon and the patient and may be the excuse for open operation. The patients demand to see the

plates and see a little displacement and are worried about it. But a little displacement does not mean that the case requires operation.

In operating it is very important to do as little separation of soft parts from bone as possible. This also holds true in osteomyelitis. If you go in and denude the fragments freely you are likely to have nonunion because you have cut off the blood supply and have not the essential features to secure union. I believe this is one reason why we have so many cases of nonunion after the use of Lane plates. Moreover, I believe it is very rarely advisable or necessary to employ Lane plates or other non-absorbable materials.

Dr. Barney Brooks, St. Louis, Mo.—Any one who is treating fractures is convinced of the lack of wisdom of laying down any general principle, for the exceptional case is always coming for treatment. We have practically discarded the open operation and the use of the plaster cast in the treatment of fractures. The man who does not get a good result in the majority of cases of fracture of the femur by traction is the man who puts the fracture up and expects that to be the end of it. The man who gets good results must do something to the traction every day. He must take frequent x-ray plates and these plates must be large enough to show a portion of the fractured bone. One thing that I have been particularly interested in and which I think is responsible for the failure to get good results in fracture of the femur is that too frequently it is forgotten that the femur is not a straight bone. Recently I took the trouble to take a femur and measure its length and its curvature and was much surprised to find that in order to straighten the normal femur it was necessary to move the foot 20 centimeters. If a femur is broken and is put up straight the foot is displaced 20 centimeters in relation to the proximal fragment. In order to get the normal anterior curve in the shaft of the femur it is necessary to make the soft parts look as if the thigh were bowed a great deal.

Dr. Z. B. Adams, Boston, Mass.—There are two fractures that I think are often difficult to treat, but which are treated successfully by traction, avoiding operation. These are comminuted fractures of the tibia and of the radius. Traction for the lower end of the tibia is applied by a pin over or through the os calcis. This pin is attached to a Sinclair skate in a Thomas splint. These feet can be controlled and drawn down and the astragalus, if it has been driven up into the tibia, can be drawn down and put in its normal relation to the tibiofibular mortice.

With the radius, the traction is applied by gluing a glove to the hand and fingers. This enables the surgeon to put the hand in the desired position in relation to the forearm and may be used with a banjo splint if the patient is ambulatory, or by counterpoise weight if he is in bed.

One other point which was not brought out in the paper is the value of reduction of fractures under the fluoroscope where manipulation can be carried on while the fragments are watched.

BILIARY OBSTRUCTION*†

By DAN COLLIER ELKIN, M.D.,
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Formerly Resident Surgeon, Peter Bent Brigham Hospital, Boston.

It is often with great difficulty that an exact diagnosis is arrived at in cases of biliary obstruction. The chief difficulty has been to differentiate between stone in the common duct and carcinoma, a point of greatest practical importance, since the one is a remediable condition, the other irremediable.

This leads to a reconsideration of the law laid down by Courvoisier in 1890. He found, in reviewing a number of cases, that when the common duct was obstructed by stone, dilatation of the gall bladder rarely followed, but when the obstruction was due to other causes dilatation of the gall bladder was common. The explanation of this difference was thought by Courvoisier to be the following:

In a majority of cases where stone blocks the common duct, there have been stones in the gall bladder itself. The chronic inflammation thus produced results in thickening and contraction of the gall bladder wall so that it is no longer distensible.

Both Fenger and Osler offered another explanation based on the fact that the stone is not always firmly wedged and its ball valve action causes an obstruction which is not complete for any length of time.

In order to test the accuracy of this rule and to attempt to find a symptom complex which would aid in its interpretation, a series of 175 cases occurring in the Peter Bent Brigham Hospital from 1913 to 1922 was reviewed. No cases were considered unless operation or post mortem had been

*From the Surgical Service, Peter Bent Brigham Hospital.

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done and the diagnosis proven, and only cases having a definite biliary obstruction are included in this study. It has seemed wise to review these cases by types in order to determine two practical questions, namely:

What cases of jaundice should have operation, and, if operation is performed, is it possible to predict whether a curable or incurable condition will be found?

Beginning with the clinical aspect, these cases resolve themselves into two main types, those having jaundice without pain and those having jaundice with pain. In practically each case this is the patient's chief complaint.

PAINLESS JAUNDICE

Of the 100 cases finally considered, 21 gave no history of pain. (Or of pain not in the least suggestive of biliary disease. It is this type of case which is of greatest clinical interest, because of obvious difficulties of diagnosis.)

Of these 21 cases the jaundice was intermittent in only 4 cases, being constant and progressive in 17. There seems, therefore, to be a definite relationship between the absence of pain and the constancy of the obstruction. This is independent of the causative agent, for jaundice was constant in five out of seven cases of stone and eight out of nine cases of cancer. Painless jaundice as a symptom suggests that the obstruction is complete, but does not point to either stone or to cancer. Of the 21 cases of painless jaundice 13 had dilated gall bladders, while in 8 this organ was normal or atrophied. Of the 7 cases of painless jaundice, due to stone, not one had an enlarged gall bladder. The remaining 14 cases of obstruction were due to some other cause than stone and a dilated gall bladder could be palpated in 13 instances. This would entirely corroborate Courvoisier's law, and the symptom complex of painless jaundice plus the presence of an enlarged gall bladder would seem almost proof conclusive of cancer. But, in the absence of a large gall bladder, the obstruction is most probably due to stone.

PAINFUL JAUNDICE

The other main type comprises that class of cases in which the chief symptom is jaundice accompanied by pain. This is the largest class, comprising 79 of the 100 cases.

In twenty, or one-fourth of these cases, the jaundice was constant and non-varying in intensity. Here, too, the presence or absence of pain is independent of the obstructive agent, for exactly one-half of the cases of cancer had definite colic.

In thirteen instances the gall bladder was enlarged, and in every one of these thirteen the cause was cancer. The remaining 7 cases were due to stone and in none was the gall bladder distended. Courvoisier's law can, therefore, be depended upon in the presence of pain as well as in its absence, for here there is not a single exception to the rule.

Of the 59 cases of painful but intermittent jaundice, there were six instances due to stone in which the gall bladder was enlarged. These were the acute gall bladders, so often palpated before operation, and in each a correct pre-operative diagnosis was made. These six cases do not affect the more important side of Courvoisier's law, which is that in the absence of a palpable gall bladder cancer is not present. In other words, if the gall bladder is not palpable, exploration should always be insisted upon, no matter what other evidence of cancer is present.

To illustrate the difficulties of diagnosis, two cases personally observed are here outlined.

The first was a man of fifty who entered the hospital intensely jaundiced and gave a story of his first attack of colic ten days before admission. He described the pain as being sharp and severe, beginning under the right costal margin and radiating to his back and right shoulder. Three days later he noticed that his skin was becoming yellow, and this condition gradually increased. In the hospital he had two attacks of severe colic, which were typical of stone. On entrance he was completely jaundiced and no bile was present in his stools. Physical examination showed a large liver and a large gall bladder. In view of the definite attacks of pain a diagnosis

of stone obstructing the common duct was made, and since the jaundice did not clear up he was operated upon a week after entrance. The gall bladder was found large, soft and markedly distended, as was the common duct. The pancreas was hard and firm, but in spite of this the duct was opened and explored. No stone could be found and a cholecyst-duodenostomy was performed. The patient recovered after a rather stormy convalescence, the jaundice disappeared and he returned home. For two months his condition improved and he gained in weight, but later developed further signs of obstruction. A large firm mass appeared in the epigastrium, evidently a carcinoma of the pancreas.

Of equal difficulty was the case of a woman of sixty-one who entered the hospital because of steadily increasing jaundice of three weeks' duration. No history of pain of any kind could be elicited. There was no bile in the stools over a period of three weeks' duration, nor could any bile flow be obtained by the Meltzer-Lyon test. The gall bladder was not palpable. Her marked loss of weight and strength, with progressive jaundice, made the diagnosis of cancer seem probable and operation was at first refused. It was finally performed at the insistence of her son, a physician, and a stone obstructing the common duct was removed and a cholecystectomy done. Her recovery was uneventful, and she has been entirely well since the operation, two years ago.

These two cases illustrate the fact that the presence or absence of pain is not a reliable symptom. They likewise show that stone as well as cancer may block the common duct and progress to complete obstruction. In each case had Courvoisier's law been followed, and the absence or presence of pain been disregarded, a correct pre-operative diagnosis would have been made.

It must be granted that there are exceptions to Courvoisier's law, but these variations are altogether logical. For instance, in two cases of cancer gall stones were present, and in each the gall bladder was small. It is likewise conceivable that obstruction may supervene so soon after the formation of stones that scar tissue contraction will not have occurred.

At one time it was felt that the finding of bile in the duodenum, as revealed by the Meltz-Lyon test, was indicative of stone rather than of cancer. This was assumed on the theory that, if cancer were present in the region of the ampulla, there would be no relaxation of the sphincter of Oddi, whereas, if the stone obstructed the duct, some bile would pass into the duodenum. A number of tests proved this theory erroneous. In three instances in which stone caused complete obstruction, there was no bile flow on repeated examinations.

From the study of these hundred cases the following conclusions were reached:

(1) Practically all patients with biliary obstruction should have operative exploration.

(2) Pain may occur in cancer as well as in stone, and is not to be relied upon as a diagnostic symptom.

(3) Freedom from pain is likewise unreliable, for obstruction due to stone or cancer may be painless.

(4) Courvoisier's law is the most reliable single sign in differentiating between benign and malignant biliary obstruction.*

DISCUSSION

Dr. J. A. Crisler, Memphis, Tenn.—Courvoisier's law is almost universally accepted and conceded. A stone in the common duct, if there for any great length of time, will have coincident with it a contracted gall bladder. The contraction may be due to tonic contractions precipitated by the presence of the stone in Nature's effort to expel it over a long period until the gall bladder becomes so small and thoroughly contracted that it loses its distensible properties. Or it may be due to the gall bladder *per se* and not be dependent upon tonic contractions. But you always have a contracted gall bladder where you have a stone in the common duct over an extended period of time. I think it was Judd who described white bile in a gall bladder in which there was a stone in the common duct with no contraction of the gall bladder, but the stone had been there only a short time.

Dr. Elkin pointed out that we cannot depend upon pain as a differentiating element in the diagnosis of gall stones or cancer of that region of the body. Sometimes pain is precipitated as suddenly by cancer as if the patient had a stone in the common duct.

In all the cancer cases that we get early the patient is entitled to an anastomosis between the gall bladder and the jejunum. It makes his life and remaining days more comfortable, but that is not all. None of us knows at present what results we are going to get from so-called deep x-ray therapy in cancer cases. Many men think we shall get a good deal from it. With the anastomosis made, giving the patient a chance, you can play on them with the x-ray over a long period of time and may even get a cure.

Dr. Frank K. Boland, Atlanta, Ga.—I think Dr.

*The writer is indebted to Dr. John Homans, Surgeon to the Peter Bent Brigham Hospital, for his help in the preparation of this paper.

Elkin's point, that the contracted gall bladder is due to a preliminary infection in the gall bladder before the formation of stone followed by contraction, is more reasonable than Dr. Crisler's theory that it is due to efforts of the gall bladder to expel the stone. So many of the laws that have been handed down to us when further investigated do not hold good that it is a comfort to feel that we have a law like Courvoisier's that we can fall back on at times. So few have been substantiated by later research and experience.

If the gall bladder is distended, according to Courvoisier's law, it is carcinomatous and inoperable. The unfortunate thing is that we often cannot tell about this before the laparotomy. There are cases in which the distended gall bladder may be palpated before operation and others may be determined by x-ray examination, but on the other hand there are cases where the gall bladder is so situated under the liver, or where it is so thick that it is impossible to tell before operation whether or not it is distended.

Dr. Joseph Gant Gaither, Hopkinsville, Ky.—I am not content to see pain as a diagnostic point so easily put aside. I think there is one word which Dr. Elkin did not use in discussing pain which we should keep in our nomenclature, and that is jaundice, not with pain but preceded by pain. In my histories of the last ten years invariably there has been pain. In developing a stone in the common duct there must have been a time when that stone passed down the cystic ducts and out of the gall bladder. Practically always jaundice preceded by pain means stone in the common duct, while jaundice coming on slowly without pain almost always means cancer. This point is as important as Courvoisier's law.

Dr. William D. Haggard, Nashville, Tenn.—In handling common duct cases surgically the mortality is 10 per cent or thereabouts. The plan of not operating upon these cases during the existence of jaundice cannot now be upheld, because we can approach them in an operative way with so much more safety than formerly. If we would look upon common duct obstruction as we do upon urinary obstruction from an enlarged prostate and do the operation in two stages, it would reduce the death rate very materially. The first stage, merely for drainage of the gall bladder with the simplest possible interference, under gas and local anesthesia, would quickly remove the stones if there are any from the gall bladder, and institute drainage of the gall bladder, not molesting the stone in the common duct at this time, just as one does not attempt to remove the obstructing prostate in the bad cases primarily. In this way the jaundice will quickly subside and the patient's general condition will improve so that one can go back and remove the stones secondarily, just as we do the prostate. By getting rid of the acute jaundice the competency of the liver is re-established. We should estimate the function of the liver by phenoletrachlorphthalein just as we do the function of the kidney with phenolsulphonephthalein. We should appreciate and evaluate the function of the liver because of all the vital functions in the whole system the liver seems to be one of the most delicate.

An operation upon a jaundiced patient, particularly when the jaundice has been present for a long time, is very apt to be followed by persistent and sometimes uncontrollable bleeding. The blood will not stay in its own vessels as is shown by the petechiae. The plasticity is decreased and the clotting time increased. That is an ever-present danger. The plan suggested by Walters for increasing the clotting of the blood by injecting 5 or 10 mils of a 10 per cent solution of calcium chlorid into the veins daily for three days before operation is excellent. It is surprising to see how the clotting time can be increased in these patients and the oozing which so often occurs can be avoided. Watch the clotting time daily and repeat the calcium chlorid again before pulling out the drain where there is a raw surface, or hemorrhage may occur secondarily. One of the tragedies of surgery on jaundiced patients, that is, secondary hemorrhage following operation, may be very largely prevented by this means.

Dr. G. T. Tyler, Jr., Greenville, S. C.—A patient recently came under my care having jaundice, but with no abdominal symptoms. His physician and I both tried to elicit a history of digestive upset; but the patient could recall no distress after eating and no attacks of abdominal pain. We thought we were dealing with cancer of the head of the pancreas. The radiogram revealed two shadows about three inches apart, but we regarded them with suspicion. At operation we found one stone in the common duct, near the ampulla, and one in the gall bladder, corresponding to the x-ray picture. There were dense adhesions between the colon and liver. The gall bladder lay nearer the posterior than the anterior surface of the liver. The stones and the gall bladder were removed. The patient was given calcium chlorid before operation and just before leaving the table. His recovery was uneventful until the fifth or sixth day, when the drains were removed. Then bleeding occurred, from which he nearly died; but fortunately he responded to stimulation. The calcium should have been continued in this case, although the coagulation time before operation was four minutes until after the drains had been removed.

Dr. C. P. Gray, Monroe, La.—In the average case of gall bladder trouble or biliary tract obstruction we do not know what should be done until after the abdomen is opened. We must consider the lymphatic supply and the circulation of the gall bladder and bile ducts. I believe it was Judd, of the Mayo Clinic, and a surgeon in New York who called our attention to the fact that to trace down and find the enlarged glands was one of the essentials in determining what the surgeon will do when he opens the abdomen. In my opinion no case with a marked jaundice should be operated upon at that particular time, because you are likely to get a fatal secondary hemorrhage.

I have not much faith in calcium chlorid and have seen patients die in spite of its use. No case with marked jaundice should be operated

upon except as an immediate relief. If even after we open the gall bladder we cannot quite make up our minds what to do, it is best to drain the bladder, leave the patient alone for a while, and if there is a stone re-operate to remove it. Then by all means consider the thickness of the common duct and the lymphatic glands down underneath the liver.

Dr. W. Frank Wells, Atlanta, Ga.—There is one form of obstruction of the gall bladder which is very rare. A man, 45 years old, with no history of digestive disturbance or jaundice, at 4 o'clock in the morning after a large dinner was suddenly seized with acute pain. It looked very much like a perforated gastric or duodenal ulcer. The leukocyte count was 23,000 and there was tenderness all the way down to McBurney's point. On laparotomy, we found a very elongated gall bladder which had so twisted itself as to be completely obstructed. It extended down to McBurney's point. There was no history of previous trouble and we could not see why it became so elongated that it twisted on itself. There was no chronic inflammation or thickening.

Dr. Elkin (closing).—I did not wish to create the impression that a palpable gall bladder in the presence of jaundice could not be due to stone. We often see an acute gall bladder which is palpable. These are for the most part due to obstruction of the cystic duct. Cases of enlarged gall bladder with stone do not affect the most important side of Courvoisier's law, which is, that in the presence of jaundice, whether or not associated with pain or intermittence, the absence of a palpable gall bladder means almost certainly that cancer is not present and that stone is the cause of the jaundice. In other words, Courvoisier's law is used from the point of view that when the gall bladder is not palpable, no matter what appearance of cancer there may be, we should always insist on exploration. Another point which we tried to emphasize is the fact that pain is an unreliable symptom, because it occurs in cancer and because it may not be present with stone.

Dr. Gaither mentions a "typical case." We are led to believe that a "typical case" of gall stone colic is one in which the pain comes on without apparent cause, is located in the right upper quadrant, radiates to the back and shoulder, and is relieved by morphin. A few days later jaundice develops. Such cases do not constitute more than 20 per cent of the patients suffering from stone, for the pain may be merely indigestion, or it may be located in the right lower quadrant or at times in the left side.

We have felt that the intravenous use of calcium chlorid in jaundice caused a decrease of coagulation time. Coagulation time as done in the test tube is notoriously unreliable: for cases in which it is practically normal may bleed profusely and others in whom the coagulation time is increased may cause no difficulty in this regard at the time of the operation.

CONSERVATION VERSUS ABLATION OF DISEASED OVARIAN TISSUE*

By DEWELL GANN, JR.,
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Little Rock, Ark.

Conservation versus ablation of ovarian tissue appeals to me as being one of the chief problems confronting the surgeon-gynecologist of today. If impressions gained from my study of current literature are correct, there is some difference of opinion regarding the problem among gynecologists of wide experience.

Graves says the majority of surgeons regard the question of ovarian conservation as forever settled and it has become a well nigh universal canon that on the performance of radical pelvic surgery, ovarian tissue, even if it be only a minute vestigium, must, whenever possible, be religiously preserved. A few have suggested, however, that the influence of the ovary on the mature human organism possibly may have been exaggerated and they have recognized that an absence of the ovarian functions may, in certain cases, be less detrimental to the patient than the irritating impairment of function resulting from mutilated organs.

Such statements rather arbitrarily divide us into two groups, one recommending conservation, the other ablation.

Whether the ovaries are ablated by operation, defunctionated by radiation, or atrophied through natural causes, certain changes in the individual are noted, the principle of which are cessation of the menses, atrophy of the genitalia, an indefinite train of symptoms supposedly the result of vasomotor changes, such as hot flushes, etc., and possibly mental disturbances. These symptoms and conditions are largely responsible for the diversity of views.

Those men recommending conservation of ovarian tissue are of the opinion (1) that the menstrual cycle is more or less essential to the well-being of the patient,

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and when deprived of it the psychological effect is such that it may disturb the mental equilibrium; (2) that hysterectomized women possessing conserved ovarian tissue aggregately suffer less than those in whom total ablation has been performed; (3) that atrophy of the vagina is of very serious portent, rendering sexual life a burden or making it impossible.

The second group, or those recommending ablation, contend (1) that the occasions in which it has been necessary to reopen the abdomen following previous conservative ovarian procedures have been too numerous to be gratifying. (2) Degenerative changes of an organic or functional nature do not occur except in rare instances, such as is occasionally seen in genital atrophy following ablation before maturity. (3) Fears of reversion to the masculine type; impairment of sexual sensibility, if previously normally established, diminution in intellect, productivity or skill of highly trained individuals; the acquisition of abnormal fat, etc., are more or less popular superstitions and without foundation.

Therefore, the solution of the problem may be said to depend upon the internal secretory value of the ovaries. Are the ovaries secretory organs or organs of reproduction, or both? Undoubtedly they are both, but as secretory organs, do they cease to function as such to the extent that they may be ablated without fear of ill effect upon the host. If so, when?

Before undertaking the discussion of such an important topic, permit me to define my views of the normal organ.

The ovary is essentially an organ designed to work. Its chief function is to ripen the 30,000 Graffian follicles bestowed upon it as a birthright, maturing as it does, twelve to eighteen follicles annually. The process begins at birth, matures at puberty, and ends with the menopause. It is universally agreed that ovarian secretion is essential for normal development, but after the age of puberty, other than the function of reproduction, very little is known about its activities, and its internal secretory value is problematical.

In an attempt to determine this value, I sent a questionnaire to four leading American gynecologists. The following questions were included:

(1) In your opinion has the ovary any internal secretory value after the age of maturity (22 years)?

(2) If so, do you attach importance to this in the solution of ovarian surgical problems?

(3) Do you, as a rule, practice ablation or conservation after the age of maturity, if the patient is to be otherwise sterilized?

(4) In cases requiring bilateral salpingo-oophorectomy, do you recommend the removal of the uterus? If so, supervaginal, or complete?

(5) Do you consider postoperative genital atrophy of any consequence?

(7) Do you recommend ovarian transplantation?

(8) Do you recommend the preservation of the menstrual cycle at some pathological hazard?

(9) What effect, if any, does ablation have upon libido and potentia sexualis?

Three replies were received. The answers were more or less uniform and all agree that undoubtedly the ovary has an internal secretory value, and this is important in the solution of ovarian problems. All agree that ovarian tissue should be conserved, in some instances, even at a pathological hazard.

If the uterus is diseased it should be removed, this always to include the cervix, when diseased.

Two agree that genital atrophy occurs in normally constituted individuals only when ablation is performed in comparatively young women; the other that it is a very serious complication in women under twenty-five years, and not infrequently for older women.

The menstrual cycle should in certain instances be preserved at a pathological hazard.

Ovarian transplantation is not recommended by Dr. Howard A. Kelly and Dr. John G. Clark. Dr. W. P. Graves sometimes practices transplantation.

Ablation has no immediate effect upon libido and potentia sexualis and, if any, only after several years, when it occurs after the age of maturity and the sexual impulse has been previously normally established.

Dr. John G. Clark says:

"I have always held to the view that the secretory value of the ovary is of decided physiological significance. In old inflammatory cases,

however, the ovary is usually so much changed pathologically that its removal is necessitated. We do not practice resection of ovaries in inflammatory cases, as the pathological sequelae are frequently prejudicial to a full recovery."

To the above conclusions I would like to add a study of the records of a series of 203 cases, upon whom some type of ovarian operation has been performed by various surgeons of Little Rock. The cases have been admitted to St. Vincent's Infirmary since April 5, 1920. They were grouped and 41 replies received to the following questions:

(1) Do you feel your operation gave you complete relief from the symptoms for which you were admitted to the hospital?

(2) If not, do you have pains? If so, where?

(3) Do you have headaches? If so, when?

(4) Do you have backache? If so, when?

(5) Do you have soreness or tenderness in the lower bowel?

(6) Are your symptoms relieved by lying down?

(7) Do you have pain elsewhere?

(8) Do you have gas on the stomach or bowels?

(9) Do you have sick stomach or vomiting spells?

(10) Do you have the whites or a discharge from the birth canal?

(11) Do you continue to have the monthly periods?

(12) Do you have bearing-down or dragging sensations in the lower abdomen? If so, describe.

(13) Do you bleed any between monthly periods?

(14) Do you have hot flushes?

(15) Have you gained weight? If so, how much? In what length of time? Have you lost weight? If so, how much? In what length of time?

(16) Do you notice any change in the bodily functions, such as increased frequency of urination, constipation, etc.?

Symptomatically, thirty-two of the forty-one patients presented themselves for the relief of pain or discomfort in the lower abdominal quadrants, six for unilateral lower abdominal pain, and three for various disorders associated with pelvic disease, such as headache, backache, dysmenorrhea, pelvic discomfort, etc.

The average age in the entire series was approximately 35 years, the youngest being 14, the oldest being 66; 174 were married, 29 were single.

Of the forty-one replying to the questionnaire, seven had supravaginal hysterectomies with removal of the adnexa, four bilateral oophorectomies, twenty-three unilateral oophorectomies, two bilateral ovarian resections, two unilateral resections, and five miscellaneous operations to include resection of one and ablation of the other. Twenty-seven of the forty-one cases reporting were not relieved as determined by question one. In group one, two were relieved, three not relieved, two partially relieved. In group two, one was relieved, two partially relieved, one not relieved. In group three, seven were relieved, eleven not relieved and five partially relieved. In group four, four were relieved, one not relieved, and two partially relieved.

In those cases reporting as "not relieved and partially relieved" none complained of mental disturbances, exaggerated vasomotor disturbances or atrophy of the genitalia. Through a personal interview, I am informed by an ex-resident of the Arkansas State Hospital for Mental and Nervous Diseases that mental disturbances seldom occur except in the psychoneurotic type, and such may occur, not only following operations for ablation but operations for pelvic disorders other than ovarian disease during which especial attention has been paid toward conservation of ovarian tissue.

A very close review of the literature on this subject proves more or less conclusively that auto-ovarian transplantations are of speculative value and hetero- and homo-transplantation are of no value whatever. What degree of menopausal symptoms are due to ovarian disturbances and what degree to injury of pelvic nerves incident to operation remains a disputed point. It has been definitely shown that in women who suffer most from an artificial menopause, 23 per cent are over 45 years of age. Many clinicians are of the opinion that the advantages accruing from retaining the ovaries are more than counterbalanced by the risk to which the patient is subjected from subsequent possibilities, when they are to be otherwise sterilized and a sufficient portion of the endometrium cannot be preserved to maintain the normal periodical menstrual cycle.

Serial No.	Case No.	Complaint	Operation	Result
1	6472	Pain in epigastric region	Oophorectomy, left Salpingectomy, left	Relieved
2	5568	Abdominal pain Menorrhagia	Punctured cyst, right ovary Resection left ovary and tube	Relieved
3	6471	Pain in lower right quadrant of abdomen	Oophorectomy, right Salpingectomy, right	Not relieved
4	6744	Pain in lower right quadrant of abdomen	Oophorectomy, right Salpingectomy	Relieved
5	6258	Pain in lower right quadrant of abdomen	Hysterectomy sub-total leaving cervix Oophorectomy, right. Salpingectomy, bilateral	Relieved
6	2548	Pain in lower right quadrant of abdomen	Oophorectomy, right Salpingectomy, left	Not relieved
7	2719-B	Pain in lower right quadrant of abdomen. Digestive disturbances	Salpingectomy, right	Partially relieved
8	5536	Nervousness, backache Abdominal pain, pelvic pain	Supra-vaginal hysterectomy Resection left ovary	Not relieved
9	6178	Pain in lower quadrants	Oophorectomy, right. Salpingectomy, right Suspension of uterus	Not relieved
		Present symptoms; abdominal pain, severe pressure in lower abdomen. Nausea and vomiting.		
10	7668	Pain in lower quadrants	Resection, rt. ovary. Salpingectomy, bilateral Dissection of rt. cornu and proximal rt. tube	Relieved
11	5532	Dysmenorrhea	Oophorectomy, right	Not relieved
12	7181	Abdominal and pelvic pain Nausea and vomiting	Oophorectomy, right. Salpingectomy, right	Relieved
13	5743	Abdominal pain, backache, headache	Resection both ovaries	Not relieved
14	6931	Pain in lower abdomen	Hysterectomy, sub-total, leaving cervix. Oophorectomy, left. Salpingectomy, bilateral	Relieved
15	1239	Abdominal pain. Pain in back	Hysterectomy, sub-total, leaving cervix. Oophorectomy, bilateral	Partially relieved
		Relieved of backache. Still has pain in side.		
16	7893	Pain in lower abdomen	Oophorectomy Resection, left tube	Relieved
17		Pain in lower abdomen	Oophorectomy, right. Resection, left ovary. Salpingectomy, right. Suspension of uterus.	Partially relieved
18	6865	Pain in lower abdomen Backache	Oophorectomy, uni. Salpingectomy, bilateral	Not relieved
19	5472	Pain in lower abdomen	Supra vaginal hysterectomy. Resection, left ovary. Salpingectomy, left.	Partially relieved
		Soreness and severe pressure in lower abdomen at present.		
20	5940	Pain in lower abdomen	Oophorectomy, left. Ovarian cyst (right) excised. Salpingectomy, left	Relieved
21	6977	Abdominal pain and discomfort	Oophorectomy, right Salpingectomy, right	Relieved
22	1024	Dysmenorrhea. Headache. Pain in lumbar region of back	Oophorectomy, right Salpingectomy, right	Not relieved
23	7162	Pain in lower abdomen Dysmenorrhea	Oophorectomy, bilateral Salpingectomy, bilateral	Partially relieved
24	6832	Sensation of pressure in lower abdomen	Hysterectomy, sub-total. Oophorectomy, left. Salpingectomy, bilateral	Not relieved
		Pain at present in lower right quadrant.		
25	6899	Pain in lower abdomen	Hysterectomy, sub-total, leaving cervix. Oophorectomy, bilateral. Salpingectomy, bilateral	Not relieved
		Dragging sensation and pressure in lower abdomen at present.		
26	1991	Pain in lower right quadrant of abdomen	Oophorectomy, right Salpingectomy, right Pain still present.	Not relieved
27	1863	Pain in lower abdomen	Oophorectomy, right Salpingectomy, right	Not relieved
		Constant generalized pain in abdomen, backache.		
28	2028-B	Abdominal pain, general	Oophorectomy, uni.?	Relieved
29	7191	Pain in lower abdomen	Punctured cysts of both ovaries	Partially relieved
30	7667	Abdominal pain and soreness Nausea	Resection, right ovary	Relieved
31	4688-B	Abdominal pain, general	Resection both ovaries. Excision cyst, left tube	Relieved
32	6353	Pain in lower abdomen Nausea	Oophorectomy, right. Cyst excised, right tube	Relieved
33	5975	Pain in lower abdomen	Oophorectomy, bil. Salpingectomy, bil. Amputation of cervix. Suspension of uterus	Relieved
34	1122	Pain in lower abdomen	Oophorectomy, bilateral Salpingectomy, bilateral	Not relieved
35	2111-B	Abdominal pain, general	Oophorectomy, right. Salpingectomy, left.	Partially relieved
36	1447	Pain in lower abdomen	Oophorectomy, left. Salpingectomy, left.	Partially relieved
37	5910	Abdominal pain, lower Nausea and vomiting	Oophorectomy, rt. Salpingectomy, rt. Excision three fibroid tumors from uterus	Partially relieved
		Relieved of nausea and vomiting. Pain still present.		
38	763	Pain in lower abdomen	Oophorectomy, left Salpingectomy, left Suspension of uterus	Not relieved
39	1675	Pain in right side and across lower abdomen	Oophorectomy, left Salpingectomy, left	Partially relieved
40	5813	Pain in lower abdomen Leukorrheal discharge	Oophorectomy, left. Salpingectomy, bilateral. Suspension of uterus.	Not relieved
41	5665	Pain in lower abdomen	Oophorectomy, bilateral Salpingectomy, bilateral	Partially relieved

CONCLUSIONS

From this study and a personal experience of ten years, one of which was spent with an American gynecologist of international reputation, I am more or less forced to the conclusion (1) that except in rare instances it is not necessary to preserve the menstrual cycle to maintain the normal mental equilibrium; (2) that atrophy of the vagina is rare in occurrence after the age of maturity; (3) that while the vasomotor disturbances may be exaggerated during the artificial menopause, they are readily controlled by the administration of ovarian extract; (4) that the exaggerated vasomotor disturbances, such as exist under the administration of ovarian extract, are to be preferred to the long-drawn-out symptomatology presented in those cases in which the ovary has been conserved; (5) that after the age of mental and physical maturity ablation of diseased ovarian tissue may be practiced without fear of ill effect upon the patient, and is to be preferred to conservation in a large majority of cases.

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DISCUSSION

Dr. C. S. Pettus, Little Rock, Ark.—I most emphatically oppose the removal of both ovaries unless the saving of the life of the patient demands it. The removal of both ovaries causes the menses to cease, which is also followed by nervous phenomena otherwise unaccounted for and seen nowhere else. That the menopause is accompanied by a nervous condition similar to that produced by the removal of the ovaries, although much milder in effect, also proves the value of the ovary to woman. The exaggerated nervousness with other symptoms sometimes following the menopause, which old women claim is "only change of life" and believe natural at that time, is a manifestation of pathology, and bacteria merely waiting a chance to make an attack and take advantage of this period and opportunity. This also proves the value of the ovarian secretion to women and suggests the protection of the ovaries.

In dealing with the diseased ovary there are three cardinal points which should be considered both as to the etiology of the disease and as to the surgical procedure.

First, consider as to whether the ovary has a pyogenic infection or is degenerating; next, whether its position is normal or abnormal and whether the circulation is interrupted or uninterrupted.

If it is a pyogenic involvement, my method is to drain the ovary and take care of it just as with any other tissue. If it is a degenerated ovary I resect the worthless portion, leaving all the healthy ovary tissue that I possibly can. Ovarian structure left in that fails to perform its function fails because its position interferes with the circulation. I invariably attach one raw surface of the ovary to a raw surface of the uterus, with the view of making a new circulation to take care of the structure, which also takes care of the position. Any ovarian tissue left in this condition should respond. A peculiar thing about ovarian structure is that the smallest amount left with a satisfactory circulation will be an advantage to the patient. Even though there may not be enough left to produce menstruation, it will furnish the hormone to equalize the nervous equilibrium.

Dr. E. H. Richardson, Baltimore, Md.—The question of conservation of ovarian tissue versus total ablation is a frequent topic of discussion in the surgical section of medical societies. This question came up prominently a few years ago in the gynecological literature as the result of a paper by Dr. Graves, of Boston, in which he advocated total ablation of ovarian tissue in all cases where the uterus has to be removed. Many gynecologists, like myself, were shocked at such radical teaching from such an authoritative source and at the instigation of some of my friends, I made a collective review of the literature upon the subject, an analysis of which led me to diametrically opposite views from those of Dr. Graves. The paper based upon this study I read at the meeting of the American Gynecological Society in Philadelphia in 1918, which was afterwards published in the Transactions. Three years later the same subject came forward at a meeting of the same society in Boston in a paper by Dr. Watkins, of Chicago, who recommended preservation of the ovarian tissue wherever it could be done, and it was very interesting to note that there was not a single dissenting voice in that body to his views.

It is very important to emphasize to a general surgical section of this kind that the overwhelming majority of leading gynecologists of this country do not subscribe to the radical teaching of the essayist. It is wrong to say that wherever we have to remove the uterus we do no harm by removing the ovaries. How do we know? We do not yet know the complete function of the ovaries. We know they have at least a dual function, but when we consider their relationship to the endocrine system we know very little, and until we know much more I say that nobody can justify total ablation. Therefore, it behooves every surgeon who is going to operate in these cases to practice conservatism until he can justify on a sound scientific basis the more radical course.

It is very commonly argued by those advocating total ablation that when conservatism is practiced many of these women show future symptoms which necessitate removal, following the first operation, of any remaining ovarian tissue.

A very practical point bearing upon this assertion was brought out by Sampson in his work upon the circulation of the ovary. He showed that there is a very important anastomosis and collateral circulation between the terminal branches of the uterine artery and the ovarian artery. You remember that the uterine artery comes in through the broad ligament, turns then sharply upwards at the margin of the uterus and near the tubal insertion anastomoses with the ovarian artery. Sampson's work showed that in a very large percentage of these cases the inner third of the ovary is dependent for its circulation upon that anastomosis. Now, then, if you take out the uterus and the tubes and are not careful to preserve that portion of the mesosalpinx in which the anastomosis occurs you deprive the inner third of the ovary of all possible circulation, with the result that it undergoes degenerative changes and requires later removal, but if you take the trouble to preserve this there is no difficulty following operation. I go emphatically on record in favor of the conservation of ovarian structure in every possible case.

Dr. Gann (closing).—If I had divided the literature which I have reviewed since 1892 into two piles and placed them on a scale they would just about have balanced as regards conservatism and radicalism. My experience is not so great as that of many, but I sent Dr. Kelly a copy of the paper and received this letter in reply:

"It is a very good time to take up the question of conservation again and analyze the question in regard to common knowledge and experience. I fully agree with you in your conclusions." Personally, I have neither recommended conservation nor ablation. I simply state "ablation may be practiced after the age of maturity without fear of ill effect" upon the host.

In conclusion may I offer the following classification of ovarian tumors for your consideration:

I. CYSTIC

A. Nonproliferating (Cystomata)

(1) Simple follicular cysts.
(2) Corpus luteum cysts.
(3) Theca luteum cysts.

B. Proliferating (Cystadenomata)

(4) Pseudomucinosum.
(5) Serosum.

II. SOLID

C. Stromatogenous

Benign

(6) Fibroma
(7) Myoma.

Malignant

(8) Sarcoma.

D. Parenchymatous

Malignant

(9) Primary carcinomata.
(10 Metastatic carcinomata.
(11) Follicular carcinomata.
(12) Cystad. mal.

III. OVALOGENOUS

Germinal

(13) Dermoids.
(14) Teratomata.

EYE, EAR, NOSE AND THROAT

ULCERATIVE ESOPHAGITIS WITH PERFORATION: RECOVERY

By MURDOCK EQUEN, M.D.,
Atlanta, Ga.

Only meager and incidental attention in the past has been paid to diseases of the esophagus and larynx and the removal from them of foreign bodies. The examination of these important organs through the mouth is now an established procedure which the advent of Jackson's esophagoscope and bronchoscope has afforded. Prior to this time diseases of the esophagus could be studied only at autopsy and local treatment was ineffective and most dangerous.

Case I.—L. H., age 4, was admitted to the Grady Hospital on account of inability to take food or liquids. Everything regurgitated. He was markedly underweight and dehydrated and gave a history of having used an empty lie can as a drinking cup two years previously. On account of resulting stricture following this, a gastroscopy was performed by the attending surgeon for feeding purposes. An examination of the esophagus under direct esophagoscopy (Jackson's technic) revealed the presence of a stricture near the level of the aortic arch and an ulcerated area on the right near point of the stricture. The patient was referred to Dr. J. J. Clark for roentgen and fluoroscopic studies and his report was as follows:

"The patient was given a thick barium mixture to swallow, and was studied under the fluoroscopic screen and on films. There was observed an esophageal perforation along the posterior wall of the esophagus at about the level of the aortic arch which permitted the barium to flow across the posterior mediastinum into the right upper lobe. This had the appearance of a dissecting abscess communicating with the esophagus and the lung. This appeared to contain about two tablespoonsful of the barium solution. The lung tissue showed a reaction in the involved area. The larger part of the meal swallowed flowed into the stomach. (Examination under similar conditions three weeks later showed the esophagus permitting the barium solution to pass freely into the stomach. The perforation in the upper esophagus appeared to be closed."

The child, when admitted to the Hospital, was running a temperature varying from normal to 102.5. In order that the esophagus might be put at immediate rest a gastrostomy was performed under local anesthesia by Dr. W. A. Selman. Following this operation he was placed on the left side so that the fistulous tract might drain back into the esophagus. Nothing was given by mouth except cracked ice in small amounts and bismuth subnitrate on the tongue. After the condition of the child warranted it, a general anesthetic was given and the stricture was dilated under direct illumination. The writer takes this opportunity of censoring the blind dilation of the esophagus by any of the methods now in vogue. Perforation of the esophagus frequently occurs when blind dilation is used, especially should the dilating instrument find its way into a diverticulum or should a low grade esophagitis exist above the point of stricture due to the contact of the esophagus with decomposing food. The walls of the esophagus at this point are already dilated by the accumulation of food and, being extremely thin, are easily perforated. This case represents an instance where a low grade ulcerative esophagitis existed in which Nature had time to wall off this ulcerated area. Had not this condition existed a fatality would have resulted due to the sudden liberation of food into the mediastium. The child at the end of five months was discharged from the Hospital, being able to take a soft diet.

Plate 1.—Lateral view of thorax. Shows barium leaving esophagus and passing into right upper lobe.

In the handling of these cases the writer would suggest a method of treatment that he has used for the past two years, namely: that following the acute stage the esophagus be dilated by gently passing the esophagoscope. It will be seen that this simple procedure separates the esophageal walls at a time when the process of healing is taking place. The walls of the esophagus, it will be recalled, are for the most part in approximation. In other words, the esophagus is a collapsed tube and it is quite easy for these ulcerated areas to heal together and thus cause a

stricture. Now, any method which will keep the ulcerated areas from healing together, while in itself not interfering with the normal process of repair, is to be desired. These stricture cases are urged to return for examination every three

Plate 2.—Oblique position. Demonstrates esophageal fistula across mediastinum into right upper lobe.

months so that should contractions commence dilation may be resumed.

The need of this "follow-up system" is well illustrated in three cases seen by the writer in which foreign bodies were superimposed upon old lye strictures. In one instance a child swallowed a whole grape, in another a plum seed, and the third a ball from a ball-bearing skate. All of these cases previously had had a gastrostomy for feeding purposes, but in none of them had the esophagus been repeatedly dilated in order that subsequent strictures might be prevented. These foreign bodies undoubtedly would have safely passed the esophagus had they not come in contact with old strictures.

401-4 Grand Opera House Bldg.

CANNA SEED IN TRACHEA: CASE REPORT

By M. P. STILES, M.D.,
Birmingham, Ala.

E. S., white, female, age 1 year, was referred by Dr. L. W. Hubbard, of Tarrant City, Ala., with the following history: About two hours before admission, while playing with several small objects, including a canna seed, she suddenly coughed, choked and became quite cyanotic for several minutes, and seemed to have great difficulty in breathing. The mother noticed that the canna seed had disappeared and called in Dr. Hubbard, who made a diagnosis of foreign body in the air passage, and immediately brought the child in for treatment. He stated that during the thirty-minute trip the baby had several paroxysms of coughing, and each time became quite cyanotic, and then after a few moments would begin to breathe comfortably.

Upon examination the child was breathing quietly and without difficulty, as long as respirations were shallow and there was no coughing. Upon coughing, or taking a deep breath, however, breathing immediately became quite obstructed. The baby seemed instinctively to realize this and appeared to try to breathe very gently and to move as little as possible. There was a distinct asthmatic wheeze heard at the mouth on expiration. There were no physical signs of bronchial blockage. Because of the urgent nature of the case and the non-opaque character of the suspected foreign body, x-ray examination was not made.

The larynx was exposed with a Jackson infant laryngeal speculum, and just below the vocal cords was seen the canna seed, moving up and down in the trachea as the patient inhaled and exhaled. It was grasped when in the subglottic area with slender alligator forceps, and gently brought out between the vocal cords and removed. The operation required three minutes. No anesthetic was employed. The dyspnea was immediately relieved and the baby made an uneventful recovery without further symptoms.

Most foreign body cases are not grave emergencies. This case was exceptional in that a delay in presenting it for bronchoscopy might very easily have allowed asphyxiation to occur if the canna seed had become firmly fixed against the vocal cords during a paroxysm of coughing. On the other hand, if it had become fixed in a bronchus, it would have been surrounded very quickly with a ring of edema, and because of its hardness and almost spherical shape, its removal would have been much more difficult.

MEDICAL EDUCATION

THE PROSPECTS OF GRADUATE INSTRUCTION IN MEDICINE IN THE UNITED STATES*

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No revelation of the Great War was perhaps more startling than that of the lack of knowledge and want of technical skill among many of the members of our profession who were called into the military service. Many were found not only to be ignorant of fundamental facts and principles, but also to be untrained in the technic of even the commoner diagnostic tests and therapeutic methods. The consequences to the men of our army might have been appalling had it not been for the wise organization of the army medical staffs and the quick provision of intensive courses of instruction and training for the newly appointed medical officers.

Medical educators, through their absorption in the teaching of undergraduate students, seemed almost to have forgotten that a hundred thousand practitioners scattered throughout the country stood in dire need of further nurture. It was high time that some of our educational authorities should be jolted out of their deplorable apathy. When the culpability of those who must be held responsible for this negligence is frankly envisaged, it is a little difficult to forbear from harsh judgment.

PRAISEWORTHY EFFORTS IN BEHALF OF THE PRACTITIONER

Notwithstanding the blameworthy unconcernedness of too many in high places, grateful recognition is due to those who continually showed an interest in the "forgotten men" in practice. Among those I would cite the late Sir William Osler, of Baltimore, whose affection for the "family doctor" was only one of his many lovable traits, and whose text book of medicine was a powerful agency of the best kind of graduate as well as of undergraduate instruction; the Mayo brothers of Minnesota, who for many years have been untiring in their efforts to increase the opportunities of practitioners for continuation studies; Dr. Wyeth, of New York, who was instrumental in placing much of the vast clinical material of that great city at disposal for graduate instruction; Dr. Richard Cabot, of Boston, who has never wearied in his efforts to interest men in practice not only in general self-improvement, but especially also in the psychic and social aspects of medicine; Dr. Victor Vaughan, of Ann Arbor, an eminent preacher of preventive measures in everyday practice; and Dr. Frank Billings and Dr. Arthur Dean Bevan, of Chicago, whose efforts for the general welfare of the practicing profession have been notable.

Of equal if not of greater influence still in bettering conditions in general practice have been our better medical journals and their able editors. Who can calculate, for example, the benefits to practitioners of the *Journal of the American Medical Association*, edited by George H. Simmons? And here in the South who can estimate our debt to the SOUTHERN MEDICAL JOURNAL for its educative influence, and to Dr. Seale Harris, who saw the need for it and did so much to insure its success?

VARIETIES OF GRADUATE INSTRUCTION NEEDED

The needs of graduates in medicine for information and training throughout life are many and varied; they cannot be satisfied by any single agency, but demand rather a whole series of instrumentalities, institutional, associative, personal, and literary. No single graduate has the same instructional needs as any other, and each locality and region will be creative to a certain extent of particular requirements. The problems of practice differ in a metropolis from those of smaller cities, towns and rural districts, and the kind of graduate education suitable for the practitioners of one area may be inappropriate for those of another. Furthermore, in a vast territory like the United States, regional differences in climatic conditions, local variation in the general nature and occupations of the people, and diversity in their economic, social and cultural status are more or less determinative of the character and distribution of professional personnel. Those who assume the responsibility for organizing graduate instruction should carefully consider all the general and local wants, should compare these with actual and potential resources for satisfying them, and should earnestly and systematically enter upon the task of adapting available means to desired ends.

MEDICAL LITERATURE AND MEDICAL SOCIETIES

Medical journalism is, I think, performing its task of giving the man in practice opportunity to keep in touch with what is new in medical science and technic fairly adequately. We have long had excellent weekly and monthly medical journals and year books that make an especial appeal to the practitioner. Recently certain publications,

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like *Physiological Reviews and Medicine* (with its analytical reviews of general medicine, neurology and pediatrics) in this country, and *Medical Science: Abstracts and Reviews* in England, have been attempting to supply a need that was so well met in Germany before the war by the various *Ergebnisse*. Publications like the *Medical Clinics of North America, Surgical Clinics of North America,* and similar volumes from clinical institutes and privately practicing groups, illustrating concretely as they do the way in which individual patients are studied and treated by some of the leaders of our profession, are very helpful and have attained to well-deserved popularity. As regards one-volume text books that epitomize the essential facts of diagnosis and treatment in medicine, surgery and the several specialties with frequent revisions to insure up-to-dateness, we are, I think, less well off, save for a few notable exceptions. Authors and publishers seem rather to exhaust their energies and means in the preparation and publication of larger treatises, the so-called "systems," and, though many of these systems are worthy, they cannot, of course, fill the place of the much-needed single-volume expositions that periodically present briefly, clearly and attractively the theoretical and practical data that the busy family doctor can and should apply in his work. There are, it would seem, but relatively few men who possess the special ability requisite for the preparation of an illuminating text book, and of these the majority are so pressingly engaged in other activities that they rarely can spare the time and energy necessary for its production. It is my belief, however, that as American medicine gains in maturity our medical texts must gradually increase in adequacy.

Medical associations have multiplied rapidly and have become steadily more efficient in the performance of their educational functions, an advance which was to be expected in a country whose people are noted for their organizing powers. The diffusion of medical knowledge and the stimulus to better practical work attributable to our city, county, state, tri-state, regional and National medical societies, general and special, cannot fail to be gratifying to those who are interested in graduate medical instruction. The growing tendency to make provision for the holding of clinics in connection with the meetings of these societies would also seem to be praiseworthy, for I am told that decided improvements have been observed in the work of the practitioners who have attended such clinics.

EXTENSION WORK IN MEDICINE

Extension work in medicine tries to fill the gap in graduate instruction that lies between that obtainable through reading and through attendance upon the meetings of medical associations on the one hand and, on the other, that which requires attendance at an organized graduate medical school. Of such extension work there is a vast field for cultivation, the tilling of which has practically just begun. The idea underlying this extension work is to make it possible for every physician to continue his medical studies at home, or near his home without interference with the work of his practice. Extension work brings the possibilities of self-improvement to the practitioner's door when it is not practicable for him to seek it afar.

Educators are feeling their way to the most profitable methods of conducting their medical extension work. The experiments that have already been made in Maryland, North Carolina, Wisconsin, Minnesota, Pennsylvania and several other states have proven that vast latent potentialities for serviceable extension work everywhere await development.

INTRAMURAL INSTRUCTION IN ORGANIZED GRADUATE SCHOOLS

This country has lagged far behind Europe in the development of organizations devoted solely to graduate medical instruction. Some of those who were wisest in pushing the reform of undergraduate teaching seem to have harbored the erroneous idea that when it could be made sound the need of postgraduate education would largely disappear. But medicine is a rapidly progressive science and art, and men in practice and not in close touch with the activities of great medical centers will always need to return to them periodically for a "brain-dusting" and for intensive continuation studies. And what is more, until graduate instruction is comprehensively planned and provided for, we shall continue to have our difficulties with pseudospecialism (for which we are notorious), and we shall not be doing our full duty in educating men either for the higher ranks of practice or for those noblest forms of medical work that we know as discovery and invention.

There is genuine difference of opinion as to whether undergraduate and graduate instruction should be sponsored by the same institution, and there are strong arguments both for and against such an arrangement. My own opinion, for reasons that time will not permit me to discuss here, is that we shall find it desirable to have some graduate instruction given by faculties of undergraduate schools and that, in addition, we shall have other schools or faculties devoted solely to graduate work.

At least three kinds of intramural instruction will be in demand in the graduate school: (1) review or refreshment courses for general practitioners and brief advance courses in special subjects; (2) longer courses leading to higher attainments in medicine, or surgery, or to proficiency in a specialty; and (3) advanced work in clinical

and pre-clinical branches for men who are preparing to be consultants, teachers or research workers.

Review Courses for General Practitioners and Brief Advance Courses in Special Subjects.—In his early years of practice the young general practitioner should resort for a few weeks each year to a medical center for refreshment. Older practitioners, too, would do well every second or third year to visit the graduate school for special knowledge and experience. In Germany before the war, so-called "vacation courses" (*Ferienkurse*) of four weeks' duration were offered twice a year in Berlin; they dealt with topics of practical importance to the general practitioner and were skilfully organized so that an attendant for a small fee could in a month cover a large field under expert guidance. Similar courses were offered in other German cities and in Vienna. In France, the *Cours de perfectionnement* offered at the hospitals of Paris had the same aim. In this country, such short courses, though perhaps in less variety, have long been available at graduate schools in New York, Philadelphia, Baltimore and Chicago, and more recently in other cities. Courses of this sort could, with advantage, be offered in many cities of the United States, provided, always, that hospital and laboratory facilities are adequate, that the organization is systematic, and that instructors of competence and character take their work seriously.

In the early nineties, soon after graduation, it was my privilege through several consecutive years to attend the summer courses at Johns Hopkins, especially those given by Professors Osler and Welch. I shall never forget the pleasure and profit that those of us who participated in them derived from them. And how formative to our raw intelligences were the lessons instilled by minds that were mature and rich in experience! No one could convince me that there is no place for the kind of graduate instruction that was given in those short courses.

Nor was the benefit of the vacation courses limited to young graduates who were taught by seniors. The older graduates who attended also got keen pleasure from the brief courses in laboratory tests and in the newer methods of diagnostic technic that were given by the younger men on the staff. As one grows older, he learns that there is nothing more rejuvenating than to "play with the boys." To physicians over fifty I recommend this exercise as a veritable *elixir vitae.*

Longer Courses Leading to Higher Attainments in Medicine, Surgery or Public Health, or to Proficiency in a Specialty.—In addition to the government schools, there must be graduate schools for the profession at large. The regular intramural teaching of faculties for graduate instruction will prepare men over a longer period, say of one, two or three years, for higher work in medicine, in surgery, in public health, and in the various specialties. Special faculties for hygiene and public health have already been organized and endowed at Harvard and at Johns Hopkins. The faculty for graduate instruction at the University of Pennsylvania has, since 1920, offered a fairly comprehensive group of graduate courses in internal medicine, surgery, and specialties. Similarly, an excellent organization for graduate instruction has been achieved at the University of Minnesota in St. Paul in combination with the Mayo Clinic at Rochester, Minn. Each graduate student pursues work according to a definite program as in other graduate faculties of the University. He chooses his major and minor subjects in consultation with an expert adviser, becomes familiar with the literature of the subject under study, is trained in methods of research necessary for making original investigations and before taking his qualifying examination prepares a thesis (like the candidate for a doctorate in philosophy). It is probable that the universities will thus become authoritative standardizing agencies for the qualification of specialists and that before long their standards will become morally and perhaps legally dominant.

The Training of Higher Consultants, Medical Teachers, and Scientific Investigators.—The education and training for careers mentioned under this caption has hitherto been gained in various ways, usually through hospital or laboratory appointment and close association with clinical and pre-clinical workers of eminence in group clinics, in teaching institutions, or in the more liberally endowed institutes for medical research, and through foreign travel and study. Now that the principal chairs in the undergraduate medical schools and in research institutions are finding occupants who devote the whole, or at least the major part, of their time to teaching and research, under more ideal conditions of work than have ever before existed, we have reason to hope that the *Nachwuchs* of the new time will make a good showing in scientific productivity.

STATE AND NATIONAL ORGANIZATION OF GRADUATE INSTRUCTION

In order that graduate instruction may be developed in an orderly and comprehensive way, systematic organization is essential, not only in single institutions offering instruction, but also in each state and in the country as a whole. A gratifying movement in the direction of such organization is now perceptible. In state organization, the activities of Meeker in Pennsylvania, of Lyon and Wilson in Minnesota, of Arnold in Boston, of Pincoffs and Rowland in Maryland, have shown us how to make a start. But a central organization for the nation as a whole is imperative. In Germany a voluntary organiza-

tion, the "Central Committee for Postgraduate Medical Education," was formed as early as 1900, and by the end of a decade had arranged for gratuitous courses in forty-eight of the larger centers in the German Empire. In England, Sir William Osler helped to establish an association for the promotion of graduate teaching known as the "Fellowship of Medicine," which later was amalgamated with the London Postgraduate Association. In the United States, the American Medical Association in 1922 entered upon the task of the national organization of graduate medical instruction by appointing a special committee with Dr. L. B. Wilson as Chairman to conduct a special survey of conditions and to make recommendations, an important step in the right direction.

WILL AMERICA PROVE EQUAL TO HER TASK?

On account of its better economic situation, America since the war is in a better position, perhaps, than any other country to make rapid progress in graduate medical instruction. In fact, the world is looking to this country to make provisions that are no longer possible in impoverished Europe. New times bring new medical tasks that demand a newly equipped profession. To the older learning and skill must be added a knowledge and training in new subjects, an enthusiasm for preventive medicine, and a greater feeling of responsibility to the community.

There are those who are pessimistic as to our power to turn the occasion to account. For in medicine as elsewhere in this country there are groups that lack faith in our civilization, whose members abhor the present, despise the past, and are gloomy as to the future. I do not share their despair. We are, of course, beset by many difficulties. It is disappointing that freedom of life and freedom of opinion are as curtailed as they are, that obscurantism even in our schools and colleges should be as rife as it is, and that the masses are so often swept by waves of emotion that make for compulsory uniformity. But perhaps our fanaticism formerly in witch-burning, and now in dadaism, in fundamentalism, in Christian Science, in Freudianism, in prohibition, in multiglandular endocrine therapy and in other Mumbo-Jumboisms are merely by-products of our experimental habit, of our passion for progress, by the method of trial and error, and of our fearless and incorrigible tendency to adventure. One thing is certain: our people have a profound belief in the virtue of education and they will make great sacrifices to attain to their educational ideals. They can, I believe, be made to see that every physician should be a learner throughout the whole of his life and that without suitable organization of hospital and laboratory facilities for graduate instruction there will be danger of stagnation of medical thought and of the use of practical technical methods that have become antiquated. The family physician cannot get all that he needs from books and journals. He must also be brought into contact with incarnate knowledge, facts and ideas about facts that good teachers have made a part of themselves and which, when given to students, carry with them something of the giver's personality. The doctor turned student, like every other pupil, gains most from the direct action of a teacher's brain upon his brain, of a teacher's character upon his character. There is no educative influence more potent than collision of spirit with spirit. As America develops her graduate medical instruction of various types, she will doubtless find the way to combine all the essential elements into a harmonious whole. Nothing less than the best in education will be satisfactory in a country whose citizens must be counted among the most gifted of the peoples of the world.

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Discussion follows paper of Dr. Wilson, page 711.

THE DISTINCTIVE FUNCTIONS OF UNDERGRADUATE AND GRADUATE MEDICAL SCHOOLS*

By LOUIS B. WILSON, M.D.,
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We are not yet ready to depart from the time-honored theory that the function of the undergraduate school is the preparation of general practitioners; yet the university, because it is doing this work in its undergraduate school, has no

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right to shirk its responsibility for providing adequate opportunities for men properly to prepare themselves for the practice of specialties. Indeed, this work is the chief function of the graduate medical school of the university. I am using the term "practice of specialties" in a broad sense to include also teaching and research in "pure" as well as "applied" science. While these two functions of the university, namely, the preparation of general practitioners and the training of specialists, should remain distinct, they have many relationships in common and should be closely correlated. Many of the difficulties of the undergraduate school apparently arise from failure properly to supplement its work with well-organized graduate work. Let us examine briefly some of the criticisms, for example, which have been made of the work of the undergraduate school in the preparation of general practitioners and see how a clearer conception of the related functions of the undergraduate and graduate departments might assist in removing the occasion for such criticisms.

Some of the major complaints against undergraduate medical education as it exists at present are as follows:

(1) There is lack of proper correlation between the pre-clinical and the clinical branches. The dissociation between the two groups of teachers is increasing. There is a tendency on the one hand for the pre-clinical instructors to concentrate their research on phases of their subjects which have, if any, only most remote clinical bearings, and consequently the subject matter they teach to undergraduates is likely to follow their lines of research and to diverge widely from clinical applications. On the other hand, the teachers in clinical fields are developing within the clinical departments themselves subdivisions of the pre-clinical branches as related to clinical medicine. This has a tendency further to emasculate the pre-clinical departments by robbing them of what, to the undergraduate, appear to be those phases of the subject of most vital importance. The remedies which have been suggested for this unfortunate state of affairs consist in recommendations: (a) that pre-clinical instructors be given clinical relationships and responsibilities, and (b) that instruction in clinical departments be placed earlier in the curriculum.

The first recommendation is difficult to carry out because so large a percentage of the present whole-time instructors in pre-clinical branches are without clinical experience and are teaching students equally without clinical experience.

The second recommendation meets obstacles in the student's lack of ground work for forming an intelligent conception of disease unless he is already acquainted with normal anatomy and physiology.

If pre-clinical instructors clearly recognized that pre-clinical branches are in themselves specialties, with the finer details of which the general practitioner should not be expected to be conversant, much of what is now taught in the pre-clinical fields to prospective general practitioners might well be relegated to the graduate school, there to be made the subject of major study by men preparing themselves for teaching or research in pre-clinical fields, or of minor study by men preparing themselves for the practice of clinical specialties. The recognition by faculties of medical schools that advanced research even in pre-clinical branches is fundamentally a function of the graduate school would do away with many of the abortive attempts to further such research by undergraduates who are inadequately prepared to undertake it. On the other hand, it would provide a selected group of graduate students whose advice and guidance by the chiefs in pre-clinical fields would more likely result in the production of worth-while research work, and also in the development of worth-while teachers and research men in pre-clinical fields. I do not mean to imply that any student should not have his chance to try his hand at investigative work. I am only saying he should first be properly prepared before attempting it.

It may be suggested also that review and research in pre-clinical fields by graduate students who have already had at least some clinical experience is likely to have a wholesome influence on the teachers of pre-clinical branches by broadening of their viewpoint to a clearer appreciation of the clinical applications of their sciences, which is so essential.

(2) There is no doubt that the attention of medical students is too closely focused, especially for their last two years, on clinical specialties, not only in didactic instruction, but more particularly in their attendance on specialty clinics. I cannot help feeling that compulsory student attendance on special surgical clinics, for example, is greatly overemphasized. Recently, while making a survey of graduate medical work for the American Medical Association, we were assured by the Dean of an excellent medical school that the function of the school was the training of general practitioners, and that it had neither sufficient teaching personnel nor adequate clinical material under its control to devote any considerable part of either to graduate instruction in the specialties. Yet, within half an hour we were ushered into the clinic of the Professor of Surgery in the same institution, who for several hours had been engaged in a difficult operation on a patient's basal ganglia; and ranged about him in the amphitheater was the entire junior or senior class, few of whom could possibly have seen what he was doing with his fingers and instruments. One is led to inquire from such an instance whether it were not better for the school frankly to acknowledge

the error of requiring frequent attendance on such clinics by undergraduate medical students, who in their future theoretic role of general practitioners would be severely criticised for attempting any such operation. At the same time, should not the university reserve such valuable surgical material for the intensive training of a few surgeons? In fact, I very much doubt whether the operative clinic of any sort, except perhaps that of emergency surgery and of obstetrics, should have its dramatic possibilities augmented by required frequent amphitheater attendance. The surgeon might better spend the time in bringing to the attention of his undergraduate students the diagnostic phases of his surgical cases and the postoperative results as shown at dressings, in late progress and in the morgue.

Surgery has a great field; and if that field be occupied by men thoroughly trained in anatomy, physiology, pathology and diagnosis, as well as in operative technic, it will develop its highest usefulness to mankind. But operative technic should not be so much emphasized to the undergraduate who is to become a general practitioner. On the other hand, the university should provide in its graduate medical department much better organized and much more thorough training in all phases of surgery than is now available, except in rare instances.

(3) There is a general feeling abroad that general practitioners are becoming too few, and specialists too numerous; that rural districts are being badly served by general practitioners and urban districts oversupplied with specialists.

When one studies the personnel of the faculties of our medical schools and the curricula, certain reasons for these conditions are pertinently suggested. The first of these is founded on the general principle that even educated men are, to an extent which we dislike to acknowledge, creatures of imitation. Our selection of vocations is partly guided, though not always successfully, by the suggestion which comes from acquaintance with successful individuals in the same vocations. During the last two years of a medical student's course he is brought in contact only with specialists in clinical branches. Whatever inclination toward pre-clinical branches he may have from association with his pre-clinical instructors is likely to be displaced by impressions derived later from his clinical instructors. But most of all, at no time in his entire educational career is he brought in intimate contact with the general practitioner. There are practically no general practitioners on the faculties of medical schools, or at least few who would acknowledge themselves to be general practitioners, and certainly none who are general practitioners in rural communities. If our medical schools thus tacitly imply that the general practitioner has nothing to teach the medical school or is unfitted to give instruction to the medical student, how can we expect medical students to have their aspirations directed toward general practice as a life vocation? And yet there is a strong feeling, especially on the part of many specialists who may have become eminent in one of the limited fields of medicine or surgery, that there are to be had in rural general practice experiences and tests of ability which are seldom if ever met with in urban hospital and specialty practice. Indeed, there is an almost universal feeling that rural general practice is an excellent phase of preparation for any of the specialties.

I am wondering if, in addition to the hard work, long drives, bad roads, poor schools and unsatisfactory social conditions, each and all of which tend to make the rural practitioner dissatisfied with his lot, there may not be another factor in his dissatisfaction, of which he is only vaguely conscious, namely, his dissociation from medical schools and medical students.

A good many years ago the engineering schools of the country realized that they were getting out of contact with engineers. Many of them, among the earliest the University of Cincinnati, took vigorous steps to regain their old contacts. One of the plans now used by a number of the engineering schools consists in placing all of their undergraduate engineers in practical work in their several branches under engineers only remotely connected with the schools, during periods which alternate regularly with periods of study at the school. Similarly, would it not be possible for the medical schools to ask a number of good general practitioners, preferably in small towns, each to take the preceptorship of one undergraduate medical student for two periods of three months each. This might be done even by those schools without the four quarter system by using the vacation periods between the sophomore and junior, and between the junior and senior years. This plan would result in effect in six months' apprenticeship in rural general practice for medical students before receiving the degree of M.D. Every "class A" medical school, if it so desired, probably could find within the borders of its own state, and not infrequently among its own graduates, enough competent rural practitioners to take charge of most, if not all, of its undergraduates, as suggested in this plan.

The plan would certainly have the advantage of giving the young physician an intimate working knowledge of the advantages and disadvantages of rural general practice. It would bring the qualified general practitioner into more intimate intellectual contact with the latest product of the medical school. It would not only direct the attention of students and universities toward general practice, but it might also relieve the mental isolation of men engaged in that practice.

Incidentally, it may be mentioned that this closer rapprochement of the university and practicing physicians is being furthered by such extension work as that so well done by the University of Pennsylvania through its Graduate Medical School, and by the Universities of Michigan and North Carolina through their undergraduate medical schools. No doubt the good effects of such work are reciprocal, the faculties of universities being educated even as are the general practitioners with whom they come in contact.

(4) There is widespread dissatisfaction with the present state of internships in many hospitals, even the best. This, I believe, is largely because we are not clear as to the purpose of an internship. The day has gone by in good hospitals when it is regarded as a cheap system of obtaining orderlies. On the other hand, in the larger hospitals, services are becoming more and more specialized and opportunity to work in special fields, particularly in surgery, is sometimes held out as a lure to interns. Thus it may happen that the medical graduate who has previously had but little contact with patients, immediately after having received the hall-mark of the M.B. or M.D. degree, may be made all too responsible for the care of too large a number of persons needing a limited field of treatment, such as surgery. Even hospitals that do not appoint medical interns, surgical interns, and so forth, have rotating services, and the embryo general practitioner merely rotates from one specialist to another. In either case he loses the opportunity for any general clinical training, and, unless his patients are previously sorted out for him, finds difficulty in beginning his examination of them.

Why should not medical schools, in cooperation with good hospitals, try to place men in their fifth year in hospitals where they would come in contact not only with general service, but with general practitioners? At the same time why should not the graduate medical department of the university, in cooperation with specialty hospitals, provide service in such hospitals only for graduates who have taken internships on the general service, and who now, in the graduate school, are preparing themselves for the practice of a specialty? Incidentally, I should like to express here my impression that there is no logical way of improving the internship service to patients or of improving the clinical education of interns themselves, other than by making the internship a definite integral part of the educational system of the undergraduate and graduate medical schools of the university, through better cooperation between medical schools and hospitals.

(5) The country suffers greatly from a host of self-announced specialists who are unqualified to do good work. May not this be in large measure because the means for properly determining who is competent to practice in a special field are so inadequate? Although we admit that there are many defects in our present standards for the degree of M.D., and perhaps more in our state licensing systems, no one would consider returning to the custom of permitting every one to practice medicine who announced himself as a physician; yet, except for the efforts of the various specialists' societies, little has been done to indicate to the sick what physicians are competent to give them special treatment in any line. Indeed, our whole system of granting medical degrees and of licensing physicians leaves something to be desired. It is difficult to maintain in the undergraduate schools, for example, those intimate intellectual contacts between teacher and student which are so essential to a knowledge of the latter's real ability to begin the practice of medicine in a scientific manner without supervision. In graduate work, the essence of which consists in the maintenance of intimate associations between the graduate student and his preceptor, we are able to know the capabilities of the novitiate more thoroughly, and thus in a measure to sort out and turn into other channels persons who are obviously unfit for entering the special fields of medicine for practice in which they are attempting to prepare themselves. It is with this consideration in view that I deplore the tendency sometimes seen to make graduate medical work merely a continuation of the mass instruction which apparently is necessary in undergraduate teaching. The graduate student must be encouraged to go his own gait, above all to develop his initiative and individuality while inspired and advised, but never dogmatized by his preceptors. Incidentally, his personal contacts must be with faculty members with whom personal contact is worth while. The mediocre instructor should have no place in the faculty of the graduate school.

(6) Faculties like trees have a tendency to die at the top. At least the older men tend to get out of sympathy with youth. There is a camaraderie and freedom of discussion which obtains between recent graduates and undergraduates that is difficult to hold between older members of the faculty and undergraduates. For this reason the recent graduate, in the capacity of instructor of undergraduates, may sometimes succeed where older men fail. Most schools recognize this in the appointment of recent graduates to instructorships in the medical school. I believe they frequently stop short of the good they might do to the instructors themselves if they considered them not merely as instructors, but also as graduate students. A definite policy of requiring young instructors in clinical branches themselves to do prolonged serious work in the pre-clinical branches fundamental to their chosen clinical fields would result in radical improvement in the training of the clinical instructors. Indeed, I believe that many of the difficulties which the undergraduate schools now have in getting high

grade service from their instructors, hospital residents and other appointees of recent graduation might be largely obviated by considering most, if not all, of them as part-time graduate students whose personal educational development were as carefully scrutinized as that of undergraduate students. Such men, when later promoted to more responsible positions, would also have superior training in the fundamentals underlying their special fields.

CONCLUSION

It seems to me that in the organization of the graduate medical school its avowed purpose of training specialists is almost, if not quite, equalled by its retroactive benefits on the faculty and students of the undergraduate school. If one remembers that, ideally, although the two schools should be separate, the faculty of the graduate school in large measure should be drawn from the faculty of the undergraduate school, and that many of the instructors in the undergraduate school might properly be graduate students in the graduate school, the mutual helpfulness of the two departments of the university is made even more clear. Indeed, I doubt whether any university can best fulfill its duties to the state unless it in some manner supplements its undergraduate medical training with opportunities for serious graduate medical study.

DISCUSSION

Papers of Dr. Barker and Dr. Wilson

Dr. C. L. Minor, Asheville, N. C.—No man can expect to come out of medical college an expert anatomist, or an expert physiologist. Certainly the imperfect system we have had for the past thirty years has nevertheless turned out many splendid men. Men like Dr. Wilson are so full of their ideals, which may some day be rendered practical, that they are trying to push forward the wheels of medical progress too fast. It will not do to tear down the existing fabric, because we have a brilliant future. I hope that our grandchildren will have a much better education than we had, but after all, we must remember that the old school turned out Oslers and Jacobies and Janeways, Fitzes and many, many more. Our present education does not turn out expert anatomists or physiologists, but it is turning out practical, useful, often exceptionally able physicians and surgeons. Very few will ever be, or should be, research workers. Those who have the gift will be research workers in spite of everything, and those who have not cannot be turned into Claude Benards by any medical school. I maintain that our medical schools have improved within the last twenty years marvelously, and that we have a right to be proud of them, and that while of course they have much further to go, we are unwise when we demand of them the impossible.

Dr. Tom A. Williams, Washington, D. C.—I want to speak of apprenticeships to the country doctor. I graduated at Edinburgh University. When I was an undergraduate I was sent to one of these men when I had only begun to study the pre-medical subjects. So I did not myself receive very much benefit in actual medical knowledge from my apprenticeship, which lasted only a short period during the summer, but looking back upon it, I can see the value that such apprenticeships would be, not so much, perhaps, to the young medical undergraduate, even though he had his fourth year, as to the doctor to whom he went. I believe it would solve our problem of the country doctor. The country doctor's life, as Dr. Wilson pointed out, is somewhat trying, partly because he does not have the contact with medicine and with the young mind which every man ought to have and which the university man does have. It would do good to the young undergraduate because it would give him a taste of country life, and I believe that still in spite of the influx into the city, normal man loves country life when he can have it under satisfactory conditions. In that way a considerable number of men would be tempted to take up residence and practice in the country because they are cut out for that kind of thing.

But it does not mean that because a man likes country life he may not be an investigator. (A great many country doctors, especially in the South, have been investigators); but he may prefer the conditions of personal investigation which he gets in a country practice to those of a more restricted kind that he meets with in a large city and in a university. As much research is possible by men who are in daily practice as by men who are in line with a great system specifically designed for organized research.

Dr. Wilson spoke of the inadequacy of the fundamental training of the man who is going to be a specialist, who has graduated from even the best medical school. That is true. I wish again to point to precedent. I think what he suggests is already undertaken, and, perhaps, I can say successfully. That is the precedent that exists in Great Britain, where the men who are going to be teachers in medical schools, who are going to have hospital assignments, even as physicians or surgeons, are obliged to go through such an intensive training in fundamental, normal anatomy and surgery in institutes of medicine, particularly (for the surgeon as well as the physician must be a good physiologist to be a good surgeon), as to necessitate a two years' course. They then receive a degree, called a fellowship, respectively, of the Royal College of Surgeons and the Royal College of Physicians, and only when they have that degree are they eligible for the better hospital appointments or teaching positions. Those degrees are obtained in the way Dr. Wilson has suggested very often, namely, while a young graduate is teaching in the medical school, in the dispensary, perhaps, or acting as teacher to the undergraduates, so that by receiving a small emolument for that kind of work he has the facilities of the school at his disposal and his expenses are small. He has the benefit of connection with the professors, and he is enabled to

go through a few years' course after qualifying himself for the higher department in special work with a minimum of economic difficulty and a maximum of university contact. The apprenticeship system is a system brought out in the days of our grandfathers. It has ceased to exist in England now, but I see no reason why it cannot be logically and soundly made a fundamental part of medical education to the great benefit of all practitioners.

Dr. E. Bates Block, Atlanta, Ga.—All teachers are very anxious to teach students rareties, and we do not lay sufficient emphasis on the things which are well established. For example, one of my students in describing an acute anterior poliomyelitis wrote an excellent paper except that he did not mention paralysis. In going through the ward, my students read to me the histories of the cases as we go to them. They never fail to tell me that there is no tracheal tugging and that there are no tophi in the ears. I myself have felt tracheal tugging only three times and tophi in the ears twice in my life. Often on the first reading of the history they fail to tell me that the patient does or does not sleep well, a thing which every man does every day in his life. Brevity is the essential in teaching students.

The question as to whether we should control the capriciousness of our teachers is an important one, whether we should allow them a certain amount of individuality in their teaching, which adds a certain amount of variety and brilliance to the medical course, or whether we should control their caprice in teaching and have it all run in a cut and dried groove. I speak of control in the sense of its original meaning, and I speak of caprice in its original sense, capra, a goat, which may kick or butt or jump sidewise. Shall we let them jump whatever way their inclinations lead or should we have a stilted, cut and dried sort of course? It adds to the enthusiasm of the students to have the faculty differ in their presentations, not to have all of their faculty exactly alike and running along a very dry groove.

Dr. George M. Kober, Washington, D. C.—I also believe in the establishment of high grade hospitals in rural districts and the associations which go with them, such as clinical conferences or hospital societies. This, together with the organization of local medical societies covering a few townships, with more frequent meetings, is likely to stimulate interest and enthusiasm in the work and will be valuable in so-called graduate instruction. At present, our county societies cover too much territory and do not meet sufficiently often to afford the opportunities for scientific discussions. The rural county medical societies are, however, of value in maintaining an organized medical profession and an opportunity where the young and the old medical men can get together and receive the benefit of outside talent.

Dr. Barker (closing).—At Johns Hopkins, I think we might have been wiser if we had organized a separate graduate faculty for the control and direction of graduate instruction in medicine. There has always been too much teaching of undergraduates in our school by methods suited rather to graduates, and I suspect that the same mistake has been made in other schools. As to the apprenticeship system, I should be glad to see some revival of it. The methods will have to be worked out. I remember very well during my undergraduate days spending my summers with a village doctor who had a large practice in the surrounding country, and I shall never cease to be grateful to him for what he taught me. The first thing that struck me was that the cases he saw belonged to an entirely different group from those that we saw in the hospital and medical school. Only rarely did I see with him a tumor or an advanced disease of the kidneys. I saw many persons who were not sleeping well, who said that they were nervous or that they lacked appetite, or that they suffered from vague aches and pains, probably symptoms indicating the beginnings of disease. It is essential that the undergraduate student should become familiar with minor ailments as well as with the graver diseases. Moreover, I learned from that country practitioner the value of a knowledge of the social and economic relationships of the patients that he came in contact with. I have seen a hearty laugh from him do more good to a patient than the prescriptions he wrote—though he did write prescriptions, too. I felt, on contact with him, a broadening and liberalizing influence. I am sure that general practitioners in their turn will be greatly helped if they can have associated with them during the vacations students fresh from the medical schools and enthusiastic about newer methods of diagnosis and treatment.

Dr. Wilson (closing).—I fear I did not make myself at all clear concerning the relationships of the teaching of anatomy and physiology to subsequent practice. What I meant to say was that the teaching of these subjects is an inadequate preparation at present for men who are going to practice in the specialties of surgery or internal medicine, not in general practice. I have the greatest confidence in the work that is now being done by our high grade medical schools, but if you will get together as we did at Rochester last spring a group of anatomists and discuss with them the teaching of applied anatomy you will find that they will unanimously agree that it is totally beyond their function to teach the details of applied human anatomy which the surgeon needs to know. And if you will also get together, as we did at Rochester last spring, a group of physiologists and discuss applied physiology you will find that they unanimously agree that it is beyond their power and not their function to teach enough physiology for the needs of a man who is going to specialize in internal medicine. They can teach rightly in the time which is now allotted to them only those gen-

eral principles of anatomy or of physiology, as the case may be, which are applicable to the whole field of medicine. It has been necessary for the men in the past who were specializing in surgery or medicine to go to New York or Europe or somewhere else to get more of their fundamentals. I hold it is now equally necessary that the man who is going to specialize in surgery or any of the surgical specialties or in internal medicine or any one of the medical specialties to get more of the fundamentals which underlie his field than can possibly be given by an undergraduate medical school.

It has been my privilege during the past year, under the auspices of the American Medical Association, to study the graduate work in most of the medical schools of the United States, and everywhere we have gone we have been struck by the fact that almost all of the schools were doing graduate work and did not know it. That is, they were really conducting graduate work of one sort or another, but it was rather desultory, in most cases not properly organized, did not require the training and did not furnish the most economical opportunities for training which the men in special fields need. Moreover, it gave no means at the end of determining whether the man was or was not competent to begin the practice of his chosen specialty in a scientific manner without supervision. The school should say this. If the school once takes upon itself the responsibility of doing this, however carefully it may select its graduate students, however it may scan their pre-medical training, their pre-clinical and hospital training before selecting them, even then there will be a large mortality if the school is honest. That is, it will not say of every man who enters the graduate school and attempts to fit himself for the practice of a certain specialty, that in the opinion of men with whom he has come in contact he is competent to begin that practice. There will be a mortality, judging from our experience in Minnesota, of 15 to 25 per cent, even with the most careful selection. I am urging a better organization of the graduate school in connection with the undergraduate school and better appreciation of the functions of the two, and, finally, checking off by the University of the data to see who in the judgment of the faculty is competent to begin the practice of a certain specialty without the supervision of others. This, also, I might say, should be carried to the pre-clinical branches. I doubt very much whether any university has the right to give an advanced degree to a graduate student in anatomy, in physiology, in pathology, or in any one of the pre-clinical branches, whom the instructors know in the bottoms of their hearts is not competent to do teaching or research. Why should a university stamp a weak individual as a competent man and foist him off on the teaching faculty of some other school? This is quite as important as it is in the clinical branches.

THE FUTURE OF THE FULL-TIME TEACHER IN MEDICINE*

By R. A. KINSELLA, M.D.,
St. Louis, Mo.

There has been in the past few years a revived discussion of the merits of the "full-time" idea in medical education. This discussion has been largely in the form of an attack on the system of teaching students by men who, it was asserted, did not have sufficient contact with patients to produce the most useful type of doctor, or whose mental habits did not permit them to regard the patients whom they did see with that rare instinct for diagnosis which the experienced practicing physician was alleged to have acquired. These full-time teachers were thought to know more of experimental than clinical evidence and the students of such teaching would become theoretical rather than practical doctors. On the other hand, the advocates and supporters of the idea that teachers of medicine should devote their entire time to that occupation maintained that it was poor judgment to place the teaching of students in the hands of men whose chief interest lay in the development of a lucrative practice rather than in the education of doctors.

It is not the purpose of this paper to discuss the cost of the full-time system. It is assumed that only those institutions can contemplate the adoption of such a system which are prepared to meet its expenses. However, in passing it seems clear to the writer that a department of medicine can be successfully conducted for classes of 75 students on an annual budget of $35,000, allowing a salary of $10,000 for the director, provided this sum is available for the purposes of teaching and research and not diverted for the maintenance of routine laboratory service for patients.

It is the purpose of this paper to discuss the future of the full-time teacher in medicine from the standpoint of one who has viewed the question as a practitioner and as a full-time medical teacher. No matter what the viewpoint may be, the discussion is most properly based on the consideration of the amount of work to be done and the usual human capacity for work.

The amount of work to be done is great and the character of this work is complicated. Every medical department must teach established information, create new information, care for patients. The director of the department must arrange and inspire the organization which is charged with these functions. His organization will be successful in proportion to his ability to

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permeate the various activities of his department. Should he devote his time exclusively to the care of patients, his assistants in research will feel the neglect and will either follow a natural tendency to be lazy or will work without loyalty and soon will be found in another medical school. Should the director spend the greater part of his energy in the research laboratories, the statement will soon be heard about the school that he does not know clinical medicine and the disdain of the clinical men in the department will be shared by the students. The work of organization is the easiest. Any man who thoroughly believes in the ideal of full-time devotion to medical teaching and research and acts consistently with this belief will find no difficulty in stimulating others to adopt the same ideal in the same energetic way.

Caring for patients is a task which is always a heavy one, since the therapeutic needs of a patient are always broader than the need for special research and call for well-balanced judgment rather than illumination of a particular phase of the abnormal condition. This single task is one which demands all that a doctor may possess of experience, judgment and lively interest. Caring for those patients who are part of the teaching clinical service is difficult enough. Caring for private patients is frequently a time-consuming distraction.

Up to this point there seems little room for doubt that the work to be done in the medical department is enough to occupy the entire time of those who are concerned with organization, teaching and research. Indeed, it may be questioned whether any man has the capacity to do so many things to his own satisfaction and whether the full-time system has produced the type of professor who has leisure to do research personally or to think sufficiently often about such research. Full-time work is not in itself an ideal: it is merely a condition necessary for the successful conduct of medical education.

It is equally clear that the practitioner is not able to assume the burdens of teaching, research and organization and achieve any measurable success in the proper education of medical students. The practitioner is a full-time student of clinical medicine. In his highest development he brings an active knowledge of fundamental sciences into the field of clinical observation. The full-time teacher of medicine may often desire to spend more time in clinical work, but cannot; the full-time practitioner may often desire to spend more time in investigative work, but cannot. Their common ground lies in the caring for patients. The one should relinquish such duties in this field as will permit of his highest development as a producing teacher of medicine; the other should be assigned to that work in which his life activity permits him to excel. We need the professor of medicine and we need the professor of clinical medicine, and almost the same requisites of training and personal qualifications are demanded of both.

The division of this work of caring for patients is therefore a point at issue. For the purpose of maintaining order in the organization it is essential that all patients who are subjects of teaching should be under the control, if not under the care, of the professor of medicine. But there is not the same need for control of the private patients in the hospital. The ideal to be attained, namely, the instruction of students in the care of patients on the basis of accomplished and nascent knowledge of fundamental sciences, is better served if the director of the department is freed of those duties which do not contribute to attainment of the ideal. The treatment of private patients is not a factor in the education of students. The part-time members of the staff are better fitted for this work. Furthermore, private practice should be referred to the man who personally attracts such work through special qualifications. It should not be automatically referred to a man on account of his title. If the stress of economic difficulties disturbs a full-time teacher, it might be advisable to permit his departure to half time, conferring on him the title of professor of clinical medicine and retaining his services for such duties as are ordinarily performed by an associate professor of medicine, the salary to diminish as income from practice increases. This arrangement might permit younger men now leaving the field of medical education at an early age on account of the narrow prospects of becoming professor and the ever-increasing financial load, to remain in productive activity. Such a system might be productive of clinical professors of high type who could bring the enterprise of clinical medicine back to the higher plane it recently occupied. The age at which such a change from full time to part time should be made is difficult to state. It should not be so advanced that opportunities for income could not be developed, nor so immature that the cause of medical education would suffer from the incomplete development of its teachers. Perhaps 45 is such an age.

The future of the full-time medical teacher is certain. His services are demanded by the amount and complexity of the work to be done. But he should be strictly on a full-time program in that he devote his entire time to the most important features. He should not be called upon nor permitted to give a considerable part of his time to commercial phases, even though his profits be turned over to the institution. Under no circumstances should the care of private patients be referred to a doctor on account of his title in the medical school. If the director of the medical department, on account of special qualifications and experience, is called upon to treat private patients, he should receive the fees therefor. But

if this activity begins to predominate, he should relinquish control of his department and, being suitably qualified, he should be made professor of clinical medicine with a salary commensurate with the services he renders the school.

Discussion follows paper of Dr. Robinson, page 717.

TEACHERS OF THE MEDICAL SCIENCES*

By G. CANBY ROBINSON, M.D.,
Baltimore, Md.

About twenty-five years ago medical education in the United States began to be developed as an integral part of our universities. One of the first changes that was made at this time was the replacement of practitioners of medicine as teachers of the medical sciences by men who may be called professional teachers in these subjects. It soon became the ambition of every self-respecting medical school to maintain departments of anatomy, physiology, pharmacology and pathology headed by men whose whole purpose was to teach and to add to the knowledge belonging to their respective fields. Many influences, persuasive and coercive, have shared in stimulating this progress. To accomplish this change, budgets had to be provided and facilities created and maintained which strained the resources of some schools to such an extent that progress in other fields was for a time difficult or impossible. Recently, however, efforts have been directed by medical schools generally in developing the clinical departments, building and maintaining hospitals or effecting satisfactory relations with existing hospitals, and much thought has been expended on correlating the various parts of the medical school into a machine-like organization, closely held together by a chain of many links, the curriculum. There has been an orgy of standardization, relating to requirements for admission, the curriculum, hours to be devoted to each subject or to parts of each subject that must be taught, equipment and teachers that are essential for proper instruction, and the requirements necessary to obtain a license to practice medicine. This standardization has probably been a necessary phase of our progress and has accomplished great good, but happily it is a phase that is beginning to pass. More freedom, more self-respect, and a more widespread appreciation of the common goal to be reached regardless of the route traversed is appearing.

From the point of view of quantity, that is, of the supply of teachers, the medical sciences have not kept pace with the developments in other parts of our system. A few years ago there were about one hundred unfilled positions in our medical schools in the fundamental sciences and I dare say that not much change on this score today is to be found. This shortage of teachers is one of the most threatening and urgent problems we have to face. Not only is the progress of medicine largely dependent upon enthusiastic workers in the sciences immediately underlying clinical medicine, but sound medical training and teaching cannot be accomplished without an adequate corps of workers in the medical sciences. Our whole educational structure is dependent upon the men working in the subjects that are and will remain the foundations of the structure. The problem of the supply of teachers of the medical sciences cannot be solved by the workers in these fields alone. It must be regarded as a problem not only involving all interested in medical education, but also a problem which can be solved only by concerted action by all. It is for that reason that I believe it is a subject which this Conference should not fail to consider.

Having visited a majority of the best medical schools in this country, I have been impressed by the fact that there are very few departments that are training a sufficient number of men in the medical sciences to meet their own needs. When an assistant or a professor is needed, the four corners of the country have to be searched and very frequently the needs of one school are met by the crippling of another school. Men with promising futures are very hard to find, and nowhere in this country does a good stock of highly intellectual men, well trained in any one of the medical sciences, exist. There are doubtless a number of factors which are responsible for this state of affairs, some of which cannot be remedied even by action based on an altered point of view, and which it would waste our time to discuss. There are, however, other factors which can, with hope of profit, be considered.

The first question is brought to mind by a comparison of the usual type of department found in our medical schools and those found in many of the universities in Northern and Central Europe and in Great Britain. Our departments of the medical sciences are usually small affairs needing only a few rooms beyond those used for the actual teaching of medical students. In Europe these departments are often institutes taking their place with other departments of the universities where the teaching of medical students is only incidental to their many activities. It is true that the difference is greater in the spirit of the departments than in their material equipment. Krogh, the physiologist at Copenhagen, and Sturn van Leeuwen, the pharmacologist at Leiden, occupy old dwelling houses, and

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Magnus, the pharmacologist at Utrecht, inhabits an ancient church. Gowland Hopkins at Cambridge had last year two ramshackled buildings, which were filled to overflowing with about forty workers, while his new laboratory was being built. In Germany, for the most part, the medical sciences have been splendidly housed, and many students could usually be found, at least in 1922, pursuing careers in these subjects.

I believe our present shortage of teachers comes, in part, from the fact that our departments of the medical sciences have been developed too narrowly within the confines of the medical schools and not broadly enough in the wider field of the university. We have not thought sufficiently of the medical sciences as fields for development independent of their practical application to clinical medicine, and have depended for the most part upon catching here and there a man on his way through his medical course who might be attached to one of these departments. All energies are exerted on preparing students for the degree of doctor of medicine; almost none are exerted toward the degree of doctor of philosophy.

This leads us to another question that has been frequently raised lately, namely, should all teachers in the medical schools have the degree of doctor of medicine? If we accept the idea that the medical sciences should be cultivated in the broader spirit of the university we are forced, I think, to answer this question in the negative and to hold that a medical degree should not be considered essential. Pathology should probably be excluded from this discussion, as here a knowledge of disease in living human beings is essential. What we really want are highly trained anatomists, physiologists, pharmocologists, physiological chemists and bacteriologists who possess intellectual leadership and a power to attract students to their subjects. I believe we are more likely to find such men among students who have obtained the degree of doctor of philosophy with one of the medical sciences as their major subject than we are among men who have taken up these sciences after having received the degree of doctor of medicine with all the multitude of subjects upon which that degree is based.

The cry is often heard that the medical sciences must be taught from the practical point of view, and that students must know those parts of the basic sciences that have direct application to clinical medicine. The surgeon is in despair because the students do not know the sort of anatomy they must use, and the physician complains bitterly at the physiologist because the students bring to the bedside only unsuccessful bits of physiology. But these same reactions can be followed further back and you can hear the physiologists complaining of the teachers of chemistry, the anatomists complaining of the biologists, while the chemists and biologists complain that students enter college with a false notion of science spread, thinly it is true, over the school boy. I believe that the trouble lies in the American trait of trying to teach something about many things and failing to demand that our students gain real knowledge of some things. This tendency goes from the beginning of the secondary school to the end of the medical course and is indicated by a medical curriculum that attempts to include everything a man may need to know and do as a general all round specialist. A moderate amount of well digested, real knowledge and a thorough training in a restricted field will count for more in the end than a smattering of many subjects. No doubt this moderate amount of knowledge and this thorough training should be selected to meet best the future requirements of the medical student, and more thought and cooperation perhaps is needed in determining where the emphasis can best be placed. The emphasis, however, cannot be left entirely with the teachers of the medical sciences, for it is an important part of modern clinical teaching to make applications of the basic sciences to the problems encountered at the bedside, and to teach again or for the first time those parts of these sciences that have to be applied to the understanding of disease and to its treatment.

What I have said may not seem to have a bearing on the subject, but I intend it to be a plea for the non-medical teacher of the medical sciences, for I see no reason why the essential function of the pre-clinical teacher is impaired because he does not possess a medical degree. In fact, the character of training through which a man usually goes to gain the degree of doctor of philosophy is very apt to fit him better as a teacher and investigator than that required for the degree of doctor of medicine.

Neither degree represents anything approaching full qualifications, and in either case the doctorate merely represents the initial impulse toward a career. The success ultimately attained depends largely of course on native ability, but environmental influences play a large part in moulding the point of view regarding the science which has been chosen. I know a number of men who, after receiving the degree of doctor of philosophy, have become much interested in the problems of clinical medicine because they have entered an atmosphere where clinicians meet them half way and where a common meeting ground of scientific thought has been found. If this common meeting ground cannot be found, an understanding is impossible. It is upon this common meeting ground of scientific thought that the essential element in the correlation of the medical curriculum must rest. It can be attained just as readily with the doctor of philosophy as it can with the doctor of medicine if the clinician is pre-

pared to do his part and is able to take the necessary steps toward the field of the laboratory worker.

I have so far not mentioned two arguments that have been, generally speaking, most often put forward as the chief causes for the lack of teachers of the medical sciences. These are that men who have completed the medical course are seldom willing to forego the financial returns from medical practice for the meager living afforded by a university career, and that the recent developments of the clinical departments have opened new, interesting and satisfying fields for scientific careers that have taken men away from basic medical sciences. Under present conditions both of these arguments are valid, and they can be met only by improving the status of the career in the medical sciences.

However, the encouragement of men to go into these sciences for their own sakes, and not as a by-product of medical education, will relieve them of the allurements of medical practice.

I believe that it is now essential for all interested in medical education and in medical progress to combine in an effort to broaden the scope, widen the horizon and encourage the development of the medical sciences. I believe that this is the phase of medical education that now most needs financial support and active encouragement if medical education is to progress in the near future in this country.

DISCUSSION

Papers of Dr. Kinsella and Dr. Robinson

Dr. C. C. Bass, New Orleans, La.—I think the time is not very distant when we shall recognize the absolute necessity for a larger proportion of full-time teachers in the practical branches as well as in the laboratory branches.

Dr. L. B. Wilson, Minneapolis, Minn.—If we could have our so-called good medical schools endowed with chairs in the pre-clinical branches, the problem would be solved in very large measure. Dr. Barker and others have spoken today of the institutes in Europe, of anatomy and physiology, and so on. If we talk that sort of thing to the financier of our country and ask him to give us two or three or five or ten or twenty million dollars to endow such institutes, we are at once confronted with his idea that the institute is a building, and I fear we have encouraged something of that spirit among the schools themselves. An institute is not a building, as Dr. Robinson has shown very well. Any old church or shack will do if you have the men in them. I would suggest, as I have suggested before at other educational conferences, that in medical schools where we have endowments we use our influence not to try to get money put into another building, but endow a department, and that endowment with our present status ought to yield not less than $35,000 or $30,000 a year for the department of the school. I think it is not at all beyond the possibilities of our attainment, and let us not try to get six of these because there are six pre-clinical branches, but get one at a time. There is, almost in every community, some man who has money, and who ought to die, if he is not going to die immediately, who may be induced to see that one of the best things he can put up as a monument to himself is not a big building, but to endow a department of anatomy or physiology in a medical school.

Dr. E. R. Clark, Augusta, Ga.—Students should be encouraged to do research work while they are taking the regular medical course. This involves an arrangement of the curriculum to leave definite time for elective work; the suggestion of problems by medical teachers; and the encouragement of research work by regular medical students. It is quite possible to have students begin research work early in their medical course, and, by concentrating their elective time during the four years, without interfering with their regular studies, to give them a substantial start at it.

The large majority of medical students go through the four years of their medical course, not only without having had any encouragement or opportunity to make a beginning at research work, but without having heard that such a field exists.

The effect of this lack is a real tragedy in medical education, for it means that in nearly every school every year men of rare abilities, able to do conspicuous work, are lost to the research side of medicine.

At Johns Hopkins, where there has been in the past considerable encouragement of just this thing, students have frequently done excellent pieces of investigation.

While it is true that the large majority of medical school graduates go into practice, rather than into the laboratory, it is also true that training in investigation greatly increases a man's ability to practice medicine.

Should we not, then, instead of developing courses leading to the doctor of philosophy in medical branches, work toward a medical curriculum in which the medical training is on a par with the training of the doctor of philosophy; in other words, to place our medical departments themselves rather more on a graduate basis?

UNIVERSITY EXTENSION WORK IN MEDICINE*

By JAMES S. McLESTER, M.D.,
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The modern conception of a university is an institution which contributes to the education of the entire people, not merely to that of a rela-

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tively small group of young men and women who find it possible to live within the shadow of its walls.

This understanding of its function has led many universities to extend their teaching to every part of the state. This extension work, as it is called, embraced at first only such subjects as are of interest to farmers and other people in isolated districts, and the attempt was to bring to them information which would make their lives more comfortable and happier. Later, realizing that the health of the community is, after all, largely a matter of education, the universities carried their extension work further and included lectures and demonstrations in public health. Now this work is being broadened still more and in a few states it has come to include graduate instruction in medicine. The University of Alabama is now embarking upon this enterprise.

It might be argued that it were better to bring the physician to a great medical center where an abundance of clinical material is available and there to give the lectures and hold the clinics. The advantages of this are obvious, and yet there are several good reasons why the physician oftentimes will not come to the medical center. First among these is the question of expense, for he feels that he cannot afford the financial loss thus entailed. Second, he fears that if he is not always within reach his patients will go to some one else. And third, he is often kept at home by a certain inertia, to which you and I are not strangers. The fact that these considerations do keep many physicians at home has prompted the University of Alabama to take to them such medical instruction as is possible.

It has been necessary to choose between two plans. One of these, following the method adopted in North Carolina, is to employ competent physicians from a great medical center outside the State who for several months will give their entire time to this work. The objection to this plan, it seems to me, is that the instruction should come from men who are in active practice and whose clinical ability has been demonstrated, and such men are not available for all-time extension work. The other plan is to use for the routine work the best home talent, and when possible to secure from time to time for a few lectures or clinics distinguished physicians or surgeons from a distance. This last plan is the one which we have adopted.

With our present resources it will not be possible to visit every county in the State. Therefore, we shall select only those cities and towns whose physicians have in answer to our inquiry expressed a desire for such extension work, and shall arrange these centers into a circuit which will be covered at stated intervals, but we shall not include any center where less than twenty physicians register for the course.

We shall ask certain qualified Alabama physicians and surgeons to undertake these clinics and lectures. They will visit the centers singly or in pairs, and it is expected that a clinic or lecture will be held in each center once a week for eight consecutive weeks.

The cost will be defrayed in part by the State. Since our available funds are not sufficient to cover the entire expense, we shall ask each physician who enrolls to pay a small sum: $15.00 is the amount upon which we have decided. The physicians taking part in the instruction will be reimbursed to the extent of their actual outlay, but will receive no other remuneration.

In conclusion, our objects in this work are threefold: first, to teach the physician methods of accurate bedside observation rather than of elaborate laboratory procedure; second, to inform him of the newer advances in medicine; and third, to stimulate and encourage in him the desire for keeping abreast of modern medicine, in which should be included the development of a taste for good medical literature. If we accomplish these things even in small measure the expenditure of money and effort will have been justified.

DISCUSSION

Dr. Louis B. Wilson, Rochester, Minn.—In our study last fall and winter of graduate medical education in the United States, one of the most interesting phases with which we became familiar was this of university extension, particularly in the State of Pennsylvania, through the University of Pennsylvania, and in the State of North Carolina through its State University. So impressed was the committee that at the meeting of the Council on Education two or three weeks ago it was decided to make university extension one of the subjects for the educational conference at the March meeting.

Dr. Harry C. Schmeisser, Memphis, Tenn.—Realizing the need for university extension work in medicine, the University of Tennessee has recently introduced into its medical curriculum a Clinical-Pathological Conference, by means of which a course of graduate instruction is offered to the practicing physicians of Memphis, Shelby County, and beyond. All physicians are invited to attend free of any financial obligation and are urged to participate in the discussions. About 265 are being reached by this Conference, of which one hundred attend more or less regularly. Sometimes visitors from Arkansas and Mississippi are found among their number.

These conferences are held on one evening a week during the academic year.

The program of each conference is made up one week in advance. The senior member of the service from which the case is taken acts as chairman of the evening. To him is sent a copy of the program. Others are posted on the bulletin boards of the Pathological Institute and the various hospitals of the city. Each physician on

the program is personally notified by telephone. Cases are presented which as patients were studied in the wards of the Memphis General Hospital or in the out-patient department of the same, and which have been operated on or have come to autopsy. Sometimes cases from the other hospitals of Memphis are utilized. They are selected in rotation from the different clinical services and a new subject treated each time.

The program gives sufficient data for the identification of the patient clinically, the clinical diagnosis, autopsy or surgical pathological number, and the names of the physicians assigned and the part each is to take.

Those physicians wishing to familiarize themselves with the clinical aspects of the case will find the clinical record, x-ray plates, etc., in the Record Department of the Memphis General Hospital, while those who intend to discuss the pathological aspects may study the autopsy or surgical pathological protocol, the gross and microscopic anatomical material in room No. 23 of the Pathological Institute.

At the conference, following the program, the chairman calls for a summary of the clinical record of the case by the physician most familiar with the same. This is supplemented by the observations and discussions of those clinicians who studied the case during life in the order in which they made notes on the record. The various clinial charts, x-ray plates, etc., are demonstrated. Illustrations, etc., from the literature and lantern slides are projected by means of a projectoscope. Others continue the discussion who were assigned to do so because they seemed best qualified by virtue of their training, experience and interest in the subject exemplified by the case. The case is then thrown open for general discussion, at which time every one present is urged to participate. Finally the ante mortem clinical diagnosis is agreed upon and stated. With this, the clinicians have finished.

The pathologist who did the autopsy or studied the surgical pathological specimen presents the pathological protocol, demonstrates the gross anatomical specimens, preserved in their natural outline and color by the Kaiserling method, projects on the screen the microscopic sections of the case and demonstrates the cellular changes. The various laboratories specialties, as far as they apply to the case, are presented and discussed by those specializing in these subjects. The anatomical diagnosis is then stated.

With the ante mortem and post mortem findings before them, it becomes the duty of the members of the Conference to correlate the two.

The educational possibilities of the Clinical-Pathological Conference are unlimited, first, because of the large amount of material, both as cases and specimens, frequently of unusual nature arising from the large services of the Memphis General Hospital and its Out-patient Department and also by being sent directly to the Pathological Institute from the states of Tennessee, Arkansas and Mississippi. The admissions to the Memphis General Hospital during 1923 were 5412, of which 95 per cent were charity patients available for detail study. Of the 471 deaths, 151, or 32 per cent, were unclaimed bodies and became the property of the Anatomical Board of the State of Tennessee, which permitted a complete post mortem dissection of the same. The number of visits to the Out-patient Department was 70,952, while the Pathological Institute totaled 73,080 diagnostic studies. Secondly, such a clinical-pathological conference permits medical and surgical subjects to be discussed from every possible clinical and pathological aspect, ante mortem and post mortem, by men who are specialized in every branch of medicine, surgery and the laboratory.

Dr. I. H. Manning, Chapel Hill, N. C.—The idea of getting teachers to go into the rural districts to give instruction in clinical medicine was suggested by Dr. W. S. Rankin, Secretary of the State Board of Health of North Carolina, in 1916. In the same year the State Board of Health, in conjunction with the University, offered a course in pediatrics in two districts in the State. Two teachers, Dr. Hill, of Harvard, and Dr. Gierstly, of Northwestern University, were employed. Each teacher was assigned six meeting places, more or less easily accessible from day to day within his district, and at each place a lecture and a clinic were given one day of each week for twelve weeks to a group of not less than fifteen doctors; so there were in each district a total of ninety or more in the classes. We found that the plan gave satisfaction to the physicians who were taking the course and did a great deal towards improving the health conditions of the children in these particular districts. The war came on and the work was interrupted.

We began the work again two years ago. It appears from the answers to the questionnaire sent out by the Chief of the Extension Bureau that the courses have been entirely satisfactory.

Each man taking the course pays $30.00, for which he gets twelve lectures and twelve clinics. This fee has covered all expenses attached to the course, so the University has not been out anything.

The University acts largely in the capacity of an agent. It secures the teachers and assumes the responsibility for them. All details, the finding of convenient meeting places, the routing of the teachers, the collection of fees, are handled by representatives of the Extension Bureau.

The organization of the courses is much more work than you may imagine. We found that we could not sit in the office and get classes. It was necessary to send active, tactful men into the field, and they had to "beat the bushes" to get the doctors into the classes. In those districts in which the course has been given there is not so much work in getting the men out a second time. In fact, we have given courses in two districts three times, and in one district twice.

We have here Dr. Adams, who has been serving as a teacher for two summers. It may be interesting to have his personal experiences.

Dr. F. Dennette Adams, Boston, Mass.—There is one point concerning the organization of work of this nature, already brought out by Dr. Manning, which seems to me to be worth empha-

sizing, namely, the difficulty experienced in getting physicians to enroll for the courses. The Director of the University of North Carolina Extension Division found it impossible to get results by sitting in his office and writing letters. Whenever postgraduate courses in medicine have been offered, it has been necessary for him to make office-to-office canvasses in order to obtain an enrollment sufficient to enable him to carry out his plans. It is rather striking, too, that the physicians who were considered to be most in need of postgraduate instruction were not infrequently the least interested in availing themselves of the opportunities offered.

From the standpoint of the instructor the most difficult feature of the work is the necessity, in each center, of dealing with physicians not all of whom desired information along the same lines. I often found it impossible, while attempting this type of instruction in North Carolina, to arrange my talks in such a way as to make them profitable for all the men present. It is quite apparent that a talk which might be of value to one physician might be worthless to another.

It is my opinion that any university undertaking work of this nature would do well to seek its instructors at distant medical centers. Certain physicians in the home state might be even more capable of carrying out the instruction planned, but when local men are chosen criticism and charges of favoritism are sure to develop. The physician from a distant city has no "axe to grind" in the state to which he is invited and by selecting him the university protects itself against unwarranted charges of exploitation which otherwise will surely arise.

Dr. McLester (closing).—Replying to Dr. Robinson's question, the Graduate School is a department of the University and its funds come from the University budget.

UNDERGRADUATE TEACHING IN MEDICINE*

By WILLIAM KEILLER, F.R.C.S.Ed.,
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PERSONNEL OF THE TEACHING STAFF

Last March at the Ann Arbor meeting of the Association of American Colleges, I expressed rather fully my views on the teaching of anatomy, so I feel that I must here touch only briefly on that branch of undergraduate teaching with which I am most familiar, though my views must be largely based on and colored by my experience as a teacher of anatomy.

Teachers are born, not made—born with an underlying something which is to become an urgent desire to impart to others such knowledge as they may have acquired.

The Edinburgh Medical School, which I attended, is preeminently a school for teachers. Ambitious young physicians and surgeons in Edinburgh start as lecturers in the extra mural Medical School ("extra mural" meaning outside the walls of the University). They take the Fellowship (by examination) in the College of Surgeons or College of Physicians, and qualify as lecturers for the Triple Examining Board and University, and the success or failure of each depends upon his capacity to attract students; in other words, upon his success as a teacher. From among those who prove themselves successful extra mural teachers the University professors are frequently chosen. Halliday Croom, late Professor of Obstetrics in Edinburgh University, who has just died, was such an extra mural lecturer, and so was Professor Crum Brown, late Professor of Chemistry in Edinburgh University. Johnson Symington, Professor of Anatomy in Belfast, was a successful teacher of anatomy in the Edinburgh Medical School, drawing large classes when I was a student. It is said that the late Professor Crum Brown started his successful career as an extra mural lecturer with one student.

Commencing in Galveston with bare walls, my problem was to build up a completely equipped department of anatomy, with Edinburgh as my pattern. The preservation of cadavers in sufficient numbers, the creation of a teaching museum, the working out of a curriculum which should coordinate lecture and laboratory work, the theoretical and clinical sides of anatomy, was the task set before me. We had a clear slate with ideals in the faculty where Edinburgh and Pennsylvania traditions were predominant at a time when the curriculum was not overcrowded as it is today by an excess of laboratory teaching. The exigencies of a teaching position in a small school in Edinburgh had made me a part-time teacher, and I depended largely for a living on private practice. On arrival in Texas I was told that I was expected to go into practice, and I practiced in the afternoon for twenty years. I do not believe that this was lost time. It gave life to my lectures and it enabled me to work out my laboratory course in applied anatomy. When I gave up practice my clinical tendencies still prevailed. I found in the applied anatomy of the central nervous system a field of unlimited interest just opening up, and the day was all too short for the lure of the new field for discovery and development.

I shall first in my paper try to emphasize the wisdom of choosing our professors with more reference to their ability to impart knowledge and

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encourage desire for established information than for successful research.

CHIEF FUNCTION OF THE STATE-SUPPORTED MEDICAL SCHOOL

The endowed school may be given its ideal by its patrons or deliberately choose it, but I take it the first business of a state school of medicine is to turn out practitioners well equipped to enable the citizens of the state to bear their children safely and to fight disease with all the advantage that modern science can give them. This means teaching, hard, enthusiastic teaching, teaching where the teacher gives every thought, every dream, every ounce of energy that is in him to his teaching.

Very exceptional students need only a chance to get things for themselves, but even the most brilliant cannot get the most out of his opportunities in our crowded curricula without much careful guidance. In branches of medicine where teaching duties are limited to two or three lectures and six or eight laboratory hours weekly, it may be possible to do teaching and research well, but no man can teach four to six hours daily, eight months in the year and read and dream at night and work out in the day much in the research side of his subject. The importance and dignity of teaching should be realized as equal to the importance and dignity of research.

Theoretically, America prizes the education of her people above all other gifts of democracy. Practically, she houses her school children inadequately and pays her teachers a mere pittance, scarcely enough to provide for daily bread, and certainly not enough to provide for approaching age.

If discontent be divine, surely there is much divinity in educational conferences. But I wonder if there would be so much annual juggling with curricula if each one of us were teaching for all he was worth. Our teaching problems would be simpler if our faculties consisted of great teachers as the heads of departments, with research fellows under them whose work should be primarily research with very limited teaching duties. There is no teacher who is not faced with many unsolved problems calling for investigation, and he ought to have research fellows under him who might give their time and energy to the investigation of such problems, but these should not be made to divert the time and enthusiasm of his teaching staff from their teaching duties.

Necessity for clinical experience that teachers of fundamental subjects may teach medical students intelligently, interestingly and successfully. So vast are the various fundamental subjects in themselves and so limited the time at our disposal that it is very important that the teacher of fundamental subjects should have had considerable clinical experience to enable him to teach his subject interestingly to medical students. Anatomy, physiology, biochemistry and pathology are immense subjects in themselves. The teacher of anatomy may teach it from the viewpoint of the embryologist, morphologist or clinician. It will always be a handicap to any class in anatomy or physiology to be taught by a man who has had no background of clinical experience, and our necessity to go outside the medical profession for our teachers of biochemistry and pharmacology is not without its drawbacks.

That anatomy should be taught by a pure anatomist to embryo doctors will almost of necessity detract from the vitality of the subject. Yet if in the fundamental courses we give undue prominence to the applied side, if we give more than an occasional enlivening glimpse of their clinical bearings, we shall end by teaching nothing worth speaking of. So much for the personnel of the teaching staff.

AIMS OF UNDERGRADUATE TEACHING

We in Texas have to turn out reasonably well equipped general practitioners, country doctors fit to take everything as it comes. But this is not all. We, like all undergraduate schools, have also to give that broad basis of general information that is necessary to all men pretending to any knowledge of medicine.

An educated man has been defined as one who knows something of everything and everything about something; and emphatically this should apply to the well equipped physician. The something about every branch of medical education comes first and is the business of the undergraduate school; the everything about something should come later and be the business of the graduate school. And this, I fancy, is the great problem of most medical schools. I feel strongly that the training of specialists is a problem for graduate schools. Yet more, I feel that every specialist should have a foundation in general medicine, both theoretical and clinical, before he takes up a specialty. I believe that one of the errors of American medical education is a tendency to too early specialism. Every great surgeon should know something of general medicine, should at least have served his time as a medical interne, and even oculists and aurists should have a background of careful general training. And here I venture the opinion that many schools are making a fatal error in directing students into special work before they have a sufficient foundation of general knowledge. How shall I teach my students useful anatomy as a substratum for their lifework if I set one of them to investigate the variations of the celiac axis and another the level where muscular nerves enter their individual muscles?

And how can a man learn the pathology that is to be useful to him as a physician if he occupy more than a proper proportion of his sophomore time in the subject on the minutiae of cystic mastitis? It is appalling to think of the enormous amount of information in fundamental subjects which we have to impart to freshmen and sophomore students before they are fit to take up clinical subjects intelligently. And yet clinicians are trying to force clinical teaching into the freshman and sophomore years.

If clinicians will keep up their fundamental subjects, if they will themselves approach their cases and teach these cases on an anatomical, physiological and pathological basis, the freshmen and sophomores will be much more apt to take interest in these fundamental subjects. If the clinician knew his anatomy, his embryology, physiology and pathology and were prepared to apply these fundamental subjects to the elucidation of clinical phenomena, even the freshman would learn that he must know his fundamental subjects to pass in surgery, medicine and obstetrics.

This tendency to urge the inclusion of clinical teaching in the freshman and sophomore years is a backward step. Thirty years ago in America our effort was to keep students out of the wards till they had acquired enough anatomy, physiology and pathology to take an intelligent interest in Colles' fracture, the lines of infection in breast cancer, the failure of internal secretions in diabetes or the physical signs in lobar pneumonia. Now, a great surgeon has suggested that the professor of physiology should teach the physiology of shock by bringing his class into the surgical ward, should teach the physiology of the islands Langerhans by showing a case of diabetes, the physiology of cardiac valves by showing a case of aortic insufficiency.

IMPOSSIBILITY OF CONCENTRATED TEACHING IN ANATOMY

And now, too, we are threatened with the obsession of concentration in medical teaching, so much so that many great schools have concentrated the teaching of anatomy in the freshman year. I grant you that as the physical foundation of all medicine, and all the other medical sciences it belongs to the freshman or even the pre-freshman year. We are partly meeting this necessity by requiring premedical biology, embryology and vertebrate zoology, and I have supplemented this by a short laboratory introduction to anatomy early in the freshman year in which the student gets a practical acquaintance with the larger facts in human anatomy by the study of sections and opened cadavers, so that he may know in the human body the larger facts of vertebrate anatomy necessary for his histology, embryology, physiology and pathology.

As for the more detailed anatomical knowledge necessary for the intelligent physician and surgeon, I defy any man to teach human anatomy so that it will stay with the student, still less with the practitioner, in one year's concentrated work. While I live and have a voice in the planning of the medical curriculum in Texas, we shall spread anatomy over the first three years, general anatomy in the freshman and sophomore years, supplemented by a laboratory course of applied anatomy in the junior year, so that we may hope to send at least a few of our men to hospital wards thinking anatomically. My applied anatomy and special applied anatomy of the nervous system, which I call applied neurology, taught to juniors, are among the most popular classes in the college. The surgical aspects of anatomy are still further emphasized to seniors in Dr. Thompson's operative surgery course which is taught on a strictly anatomical basis. I would that we could find time in the junior and senior years for a class in applied physiology and applied biochemistry, just as our clinical pathological conferences, laboratory of clinical pathology and surgical and gynecological pathology to seniors supply us with courses of applied pathology. It is true, our laboratory of clinical pathology is to some extent a class in applied biochemistry.

What and how much shall we teach to undergraduates is one of the most difficult questions that faces each of us. Clearly we must first impart a comprehensive if somewhat sketchy view of the whole subject, leaving to after study in larger works, journals and monographs that further grasp of the special aspects of each subject which the after life, in general or special practice, of each of our graduates calls for. And here I cannot help feeling that we are much handicapped by our text books. Huge exhaustive books on every subject are the order of the day, books quite beyond the grasp of the medical student in his limited time. In America the student has the choice of these huge text books or quiz compends, and quiz compends are a tempting means of passing state board examinations, but their use means thought annihilation. The short, incisive, well selected, clearly written student's handbook written by a master of the subject is a godsend to the overburdened medical student. We used to have such books when I was a student. Brilliant examples are Treves' *Students' Handbook of Operative Surgery*, written by the same masterly writer that produced the larger work on the same subject. And Bland Sutton's little book on *Diseases of Women* is the most illuminating resume of any subject that ever was written.

In anatomy, when I was a student, we had a pocket Gray, and in Edinburgh Cunningham's masterly *Dissector's Handbook*. Today Robinson of Edinburgh, in his passion for detail, has produced a three volume *Dissector's Guide*, which,

though excellent for advanced students, is an embarrassment to the student in his first dissection, and even Jamieson's substitute for the pocket Gray has become so voluminous that its purpose is almost defeated by its wealth of detail. Osler's *Textbook* is a masterly short presentation of a boundless subject, within the mental grasp of the medical student in his limited undergraduate time. Individual teachers are trying to solve this text book difficulty by issuing mimeographed laboratory guides or notes, and with the modern development of the mimeograph students are themselves endeavoring to meet it by more or less imperfect mimeographed lecture notes.

In the choice of what he shall emphasize the teacher of laboratory subjects will be under the necessity of resisting the temptation to overemphasize the subject in which he is most interested at the time, thus sacrificing the time that should be used to give a broad, comprehensive grasp of the whole subject. This is a besetting sin of young instructors. Unless constantly supervised the young enthusiast is tempted to unload on his class the last piece of information he has mastered, even if a physician is likely to see one case in a life-time, and probably miss it when it happens along. Where there is much to select from we must emphasize our subjects according to their average clinical incidence or importance as life or function destroyers.

In his choice of subject the clinician has the advantage over the teacher of non-clinical courses. Every experienced clinician, every consultant of some years' standing, will become more and more alive to the subjects where young physicians make mistakes. So the surgeons will emphasize the early and careful diagnosis and thorough treatment of carcinoma, the radical treatment of melanotic sarcoma, the intelligent treatment of surgical inflammations, the early differential diagnosis and treatment of osteomyelitis, or the thorough treatment of palmar infections.

I wonder if we are overloading our curricula with laboratory teaching. The laboratory teaching of the pharmacodynamics of a dozen drugs at most, the laboratory preparation of half a dozen media and a dozen typical pathogenic organisms should be enough in the general undergraduate curriculum, and I think we are endeavoring to teach too much biochemistry and perhaps even too much laboratory physiology.

SUMMARY

(1) At least in state-supported medical schools not especially provided for research purposes, teaching ability should count for more in the choice of professors than research records.

(2) Teachers of fundamental subjects should have a background of clinical experience, that they may teach intelligently, interestingly and successfully the scientific foundations of medicine to prospective general practitioners.

(3) At least in state-supported undergraduate schools, the chief aim in undergraduate teaching should be to impart to students a broad general grasp of the whole subject of medicine and surgery, leaving special training to private study and postgraduate schools.

(4) It is a mistake to divert the attention of medical students into lines of special research to the sacrifice of time required for the acquisition of that background of general information in fundamental subjects which is necessary for any intelligent grasp of medical and surgical science.

(5) Any attempt to bring clinical teaching into the freshman-sophomore years is a backward step, as the entire time of the freshman-sophomore years is necessary that the student may get the foundation in anatomy, biochemistry, physiology and pathology which is a prerequisite to all sound clinical work.

(6) Teachers of clinical subjects are at fault in allowing themselves to become rusty in fundamental sciences, so that they become unable to teach the clinical aspects of medicine and surgery on a sound fundamental basis.

(7) There is great need of short authoritative, well written students' handbooks, capable of conveying a sound preliminary statement of each subject as a whole, so that the student may become well informed in the broad aspects of each subject before he attempts to read larger exhaustive text books in which he lacks the ability to differentiate between essentials and less important material.

(8) In choosing what he shall emphasize in his teaching, the teacher of fundamental subjects should never lose sight of the fact that he is teaching young doctors and should emphasize such aspects as are likely to be of practical value to the physician and surgeon, while the clinician should gauge the importance of his subjects by their relative incidence and importance as threatening life or usefulness.

(9) It is possible that the present day curricula are being overloaded with laboratory teaching.

DISCUSSION

Dr. C. M. Jackson, Minneapolis, Minn.—To promote research work, the head of the department should be an active investigator. He has to inspire the staff and students by personal example, otherwise little will be accomplished. To neglect research means to fail in our duty to contribute to the advancement of medical science.

Where the medical teachers are unprogressive and unproductive, there is also danger that the students will fail to apply the proper scientific spirit in their ordinary medical work. Since every

clinical case presents a scientific problem, they ought to carry the research spirit into their every day work. A thorough scientific training, including the spirit and methods of research, is just as important for efficiency in medical practice as it is in the advancement of medical knowledge.

Dr. J. T. Halsey, New Orleans, La.—I believe there is nothing that will better help the student to learn certain phases of anatomy, physiology, or pharmacology, or of biochemistry, nothing that will arouse in him a greater appreciation of the importance and a greater interest in the study of these subjects than from time to time during his first year and his second year to be shown clinical cases which illustrate facts in anatomy, physiology and other branches. The insertion of some clinical experience in the first two years is not so much an aid to the better clinical training of the student as it is an aid in the training in the fundamental branches.

Dr. Charles P. Emerson, Indianapolis, Ind.—Our best American medical schools have in large degree followed the lead of the German physiological school. The theology of that school taught that a man saw clearly in the laboratory and groped darkly at the bedside; and that, as a result, research laboratory work must occupy a higher intellectual plane than clinical work. For illustration: without doubt the university professor of physics could run the city's heat and light plant if he chose to, but why should he choose to? So the professor interested in medical research doubtless could learn to care for patients if he wished to, but, hinted they, why should he wish to? They believed that by doing so he would step down to a lower level. One of our medical students quoted one of these teachers as advising him to "Stick to your laboratories. You can pick up all this clinical stuff in six weeks whenever you want to." Certainly the preclinical men on our medical faculties demand the right to dictate the choice of men for the clinical subjects and then to direct their work. The English and French schools, on the contrary, consider the bedside work their highest sphere and use the laboratories to help solve the problem presented by the sick patients. To the one school the search for truth, using dog, rabbit or man, came first; any application of this in therapy was an incidental by-product. To the latter, the care of the man came first and all laboratories must cooperate in this service.

I cannot imagine a good clinical teacher of the future practitioners who is not also a research worker.

Why is the English boy intellectually two years ahead of the American boy when he enters the medical school? The trouble is not alone or chiefly in our colleges or high schools, but down in the grades where our boys are trained in fundamentals. Many of the students in our best medical schools may have passed college courses in differential calculus, but when they try to add one-third and one-fifth they have to think twice. And when they prescribe a drug they have to think twice to decide whether 1/20 of a grain is more or less than 1/80 of a grain. In other words, the problem we are struggling with is in part due to the custom of our great public schools of using teachers only just well enough educated to understand the work of that grade and of gearing up the curriculum to the mind of the boy one-tenth from the end and not to that of the boy one-tenth from the top of the class. At a European university the man who trains the child's mind has a greater responsibility than he who guides the more mature student. The professor of arithmetic in grades below the university has the same social rank, title and salary as the professors of the university.

How different in America! When will the chief difference between the one who directs the teachers of arithmetic in the grammar and high school grades and the one who directs the work of the candidates for the degree Doctor of Philosophy with higher mathematics as their major subject be that the one gets along with children better? Two countries at least are approaching that ideal. The better the instruction in the grades the less shall we worry about our medical curriculum.

Dr. Harry C. Schmeisser, Memphis, Tenn.—In the State of Tennessee it has been very forcibly brought to our attention that in the rural districts there is a great dearth of general practitioners. The rectification of this condition seemed so urgent to the State legislators, many of whom come from the rural communities, that at a recent meeting of the Legislature they attempted to pass a bill doing away with the two years' premedical training as a requirement to enter the State Medical College. They hoped in this way to attract more men from the country to take up the study of medicine, who would later settle in their home community. It would certainly have been very unwise to have met the situation in this way.

By the recent introduction of elective courses into the curriculum of the University of Tennessee it is hoped to train both general practitioners and specialists, besides the medical college is growing so rapidly in its student enrollment that a larger number of physicians are being graduated each year.

Dr. I. I. Lemann, New Orleans, La.—The trouble with curricula is that we have lost sight of our function as pedagogues. We have been so interested in imparting the sum total of knowledge in the provinces assigned to us that we have forgotten the relation of each of our functions to the whole curriculum. The situation seems almost to call for a consultation with the pedagogue. If we doctors, if we practitioners and laboratory workers are only practitioners and laboratory workers and not pedagogues, we are not fulfilling our whole function, and if we have not a sense of the whole and of the relation of the parts to the whole, we shall have to call in consultation somebody who is a pedagogue.

Dr. Stuart Graves, Louisville, Ky.—Our problem will be solved when clinical medicine is taught by clinicians grounded in the pre-clinical sciences and the pre-clinical sciences are taught by men in sympathy with clinical medicine.

Unfortunately, in all of this discussion there

is the idea that almost all of the medical curriculum is divided into two parts, the pre-clinical and the clinical parts. That idea is obsolete. In our own school in biochemistry the professor is a doctor of philosophy, not a doctor of medicine, and yet he teaches the junior students, men who spend nearly all day in clinical study, biochemistry applied to the hospital patients. In the Department of Physiology the academic teacher of medicine takes the sophomores as soon as they are through with their course in physiology and teaches them applied physiology from the standpoint of the medical teacher and medical practitioner. In pathology for years we have taken the sophomores at the beginning of their course, two weeks after they have started their study of inflammation, and met them in the dead room, where, not from text books but from records and from gross specimens and histories closely correlated, indexed and cross-indexed, we have taught them the subject of inflammation, as applied, for instance, to the heart, or the lung, or the appendix, and have taught there with inflammation the cardinal signs of those diseases. Pathology, carefully correlated with clinical medicine, has been taught these boys from these gross specimens, backed up with the study of microscopical sections. That is the ideal way to bridge the chasm. If we can bear this idea in mind, that our main object is to teach men how to practice medicine, we will solve a great many of the difficulties Dr. Keiller has mentioned.

I think the best judge of a good teacher is a high grade medical student and, if we are to base our opinion upon a cross section of opinion of the best medical students, then the courses that are taught in the manner I have outlined have proven most popular and beneficial and are regarded by the students to a man as most useful.

Dr. Robert Wilson, Jr., Charleston, S. C.—Dr. Emerson has put his finger on one of the weakest points in our educational system. That American students are not so far advanced as foreign students of corresponding age is due to faults in the primary teaching. Our system, too, tends to create wrong educational ideals. It is a mistake for college students to begin special preparation too early. Our colleges have gotten to be advanced preparatory institutions, most of the students being pre-something, for example, pre-medical, pre-law, etc., having lost to a considerable degree the conception formerly held that the function of the college is to afford a broad educational and cultural foundation.

The undergraduate student should have some contact with research, for every clinical problem is a research problem. It is true that every man is not a good research worker, nor is every research worker a good teacher. Nevertheless, we shall turn out better practitioners of medicine if we encourage the research spirit among the members of our teaching faculties.

Dr. Keiller (closing).—Do not for one moment imagine that I undervalue research. I know the lure of it, and I know that when you are absorbed with a research problem, it is liable to become a case of "Oh, damn that freshman."

Except when teaching is limited to a short term, it must be a matter of deliberately choosing between teaching and research. There are very few men who can do both wholeheartedly and efficiently at the same time. Our duty in the fundamental subjects is to enable the men in preclinical years to acquire in an exceedingly limited time a sufficient background for their clinical work. Undoubtedly every clinical case is essentially a research problem, but it is absolutely impossible for the student to face his clinical cases efficiently unless he has the necessary information in his fundamental subjects.

In choosing my instructors in the Department of Anatomy I have told them that their primary duty would be to assist students, freshmen, sophomores and juniors in all their difficulties and to help them to get absolutely the best that they can out of the only opportunity that most of them will have in all their lives to become personally acquainted in the laboratory with the anatomy of the human body. To do this, it is necessary that my instructors use the whole of each afternoon thoroughly to master the subjects covered by the various classes the following day so that they will be prepared to go from table to table giving efficient assistance to any man that requires it. As a result of this, our instructors acquire in the course of their teaching year a wonderful mastery of the subject and at least I send out from the laboratory three or four men with a very thorough anatomical background for their future work as physicians and surgeons. I should entirely fail in doing this should I use these men's time outside teaching hours for working up research problems. They would have to give about half the year to acquire sufficient special knowledge to tackle the problems intelligently and they would be unprepared to answer the many questions students ask.

PRACTICAL METHODS IN TEACHING OBSTETRICS TO UNDERGRADUATE MEDICAL STUDENTS*

By CALVIN R. HANNAH, M.D., F.A.C.S., Dallas, Tex.

The Committee on Maternal Welfare of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons has requested a statement of conditions showing a comparison of the cases of mothers who have had prenatal care with those where such provisions were lacking. This request was doubtless prompted by the fact that statistics prove that neither morbidity nor mortality in maternity has been lessened in the period from 1900 to 1920.

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Dr. Thomas Watts Eden, London, in his address, "The Maternal Mortality of Child-Bearing," says that the average mortality rate in Great Britain is about five to one thousand births; and that half of these are due to sepsis, the other half to hemorrhage and accidents of childbirth. In the United States, fifteen thousand women die from childbirth, half of these due to sepsis, a death rate second to tuberculosis in women of this age. This appalling result is in the trail where so many midwives and incompetent and careless doctors have trod.

The capacity for blundering of the human race in executing the rules of health is one of the stupendous problems before the medical schools. Common sense teaches us that we should concentrate our efforts in prenatal care and teach practical methods in obstetrics which may be applied in the hospital, in the home, ranch or the lowliest hut.

Labor is normal in 90 per cent of all cases, and this can be materially increased with prenatal care. Our methods of teaching should be practical and so animated that the student, after graduation, though he be denied hospital facilities, will execute his technic in the home with efficiency and as an asset to the family and community.

The public depends upon the medical schools to furnish well trained internists, surgeons and obstetricians, and these schools must bear this responsibility and keep faith with the people. In order that medical schools may bear this responsibility, they must have a medical plant properly and scientifically equipped. The greatest results will be obtained when these schools are supervised by teachers who realize their responsibility to the life and health of the community. There are unlimited opportunities for usefulness in the way of service to mankind, and these teachers should have the "calling," and not utilize their position to promote their own individual practice, but rather have a clearly defined regard for the responsibilities involved. The medical school is not a school for preparation of life, but is life measured by the unstinted devotion to duty, responding to the impulse for initiative, the joy of work well done. Students who want to serve the people should early learn that with life, a certain amount of drudgery and discipline are necessary for development.

The teaching of obstetrics may differ in some respects according to the personality and organization in the department. Didactic teaching is necessary, yet that method which follows a standard text book and has a tendency to cram the student with thoughts, or with data, rather than prod him into thinking is little more effective than a woodpecker working on an iron tank. Didactic teaching should be supplemented with clinics which stimulate the interest of the student and hold his attention. Constant working of this curiosity, habitual exercise of the powers of accurate observation and of mental concentration is an influence that cannot be disregarded. A spirit of criticism, sound and thorough thinking, with a recognition of responsibility are of vital importance for a clear conception of the fundamentals in obstetrics. Teachers should encourage the medical student to assume responsibility that he may be equipped to cope with situations which will confront him in the future. He must prepare himself for self-support, and, also, to help his fellow man.

It is during the period of gestation where the greatest good can be done by the application of practical methods. In the hospital and outdoor dispensary the clinics should be used extensively. These cases furnish the student with the opportunity to make physical examinations and detect any abnormalities. He comes in direct contact with the patient and learns of her domestic environment, habits of living, diet, exercise, fetometry and pelvimetry, and examinations for positions. By repetition of instructions he learns how to prevent complications and prepare her for the normal delivery and breast feeding.

The cases that show abnormality, pre-eclamptic symptoms, heart lesions or other complications should be placed in the hospital, where they will receive better supervision, and that the class may study, diagnose and treat effectively. The vast majority of these cases will respond to proper care. This active prenatal treatment will be impressive to the youthful undergraduate and teach him as no other method can how successful this practice may be. Schools that have hospitals with a large number of beds at their disposal bear a greater responsibility and opportunity to teach from a clinical viewpoint.

The tendency during the past few years for maternity cases to be hospitalized demands hospital facilities. This progress will continue to raise the standard in this department that it may rank with the other major subjects and make its scope of influence felt.

In the construction of a new plant, or in the reorganization of the old, arrangements should be made for adequate facilities in obstetrics along with medicine and surgery. It has been said that 65 per cent of the operations in women are due to poor obstetrics. If this be true, it is the duty of the medical schools to prepare at once to remedy this condition by more and better facilities which will improve the teaching of obstetrics.

Obstetrics, as now conducted, with so many cases delivered in the home, should have competent instructors and nurses who are willing to give of their time. The present remuneration for such service in most places is insufficient. More funds should be had to properly equip the maternity departments and secure nurses and compe-

tent instructors to do the normal and less complicated cases. Unless the work in obstetrics is conducted by teachers who are qualified, the student does not develop that high sense of regard for the necessity of efficient work in obstetrics.

This department must have sufficient hospital beds in proportion to the enrollment so that the abnormal cases coming into the dispensary may be placed in the hospital for daily ward rounds and effective treatment. For an enrollment of fifty students per class, a minimum of twenty beds should be available. This would be approximately forty deliveries per month and reservation for abnormal cases. This will give to each student about twenty hospital deliveries, providing that a certain number of the students would work during the summer months, which may be voluntary, or compulsory if necessary.

The technic used in the hospital should be simple and easily executed. The repeated application of the routine in the hospital and home will teach its value and establish it in the community.

The outdoor clinic and the cases delivered in the homes should be directly connected with the department so that all difficult and complicated cases may be brought into the hospital for treatment. Cases of abnormalities and pathological complications attended in the home do not impress the student with the gravity and responsibility that obstetrics demands. In the teaching of obstetrics to undergraduates, one of the weak points is the failure to emphasize that in emergencies they should seek the service of an obstetrician rather than a surgeon who may not be qualified in obstetrics. Surgical and medical cases are hospitalized and do not require the students to go into the homes. If the officials of the medical schools thoroughly understood and appreciated the necessity of assembling more of the obstetrical cases in the hospital, then obstetrics would have equal facilities and advantages for teaching. Fifteen or twenty cases of delivery in hospital and home are not a sufficient number to qualify a graduate as a competent obstetrician. The responsibility is too great; and more cases, both normal and complicated, are necessary to prepare the average student for modern work in this branch.

Teaching of obstetrics in Baylor is planned so that, when the student is thrown upon his own responsibility, he has a definite plan to follow. All members of this department try to prepare the student for definite and practical service.

At the beginning of the junior year, the students are taught to recognize a normal uterus by making vaginal examinations on patients who are not pregnant. We must have the normal upon which to base a comparison of the changes taking place in the uterus during pregnancy. If in teaching physical diagnosis, the normal respiratory sounds and regular heart beats are to be recognized before attempting the abnormal, then it is just as essential to recognize a normal nonpregnant uterus that may later be compared with the changes occurring during gestation. This method is practical and furnishes a fixed idea, and a failure of this accounts for the inability to diagnose pregnancy in the early stage. Each sign or symptom of pregnancy, as, Hegar's, Chadwick's, Braxton Hick's, changes in the mammary glands, palpation of the fetal parts and auscultation of fetal heart sounds should be demonstrated in the clinic. This is effectual and a dynamic force in teaching obstetrics. By this method, the subject becomes animated and prepares the student for the practical work rather than a final examination. Under such instructions, he will become familiar with the changes occurring during pregnancy. The student may be able to describe from quiz or lecture all the signs and symptoms of pregnancy, but yet not be qualified to recognize them from a clinical viewpoint.

In our outline of teaching, we emphasize careful observation during the first stage of labor. We teach him to make frequent physical examinations and carry the responsibility of reporting the condition of the mother and fetus during labor. He is taught that the change in the lower uterine segment is largely formed before the onset of labor, and is completed at the termination of effacement of the cervix; that dilatation follows effacement; that he should know when this is complete, which differentiates the first from the second stage; that the second stage is the stage of expulsion, or birth of the child. He must have a relative knowledge that is applicable to the individual case as to existing proportion between the pelvis and fetus gained by pelvimetry and fetometry. The third stage is a two-stage delivery: first, the separation of the placenta and chorion recognized by the fundus of the uterus ascending; and, second, by the expulsion of the placenta and membranes. This teaches the necessity for prophylaxis to avoid complications, especially post partum hemorrhage and infection.

We try to teach practical methods that may be safely applied to occipitoposterior position, eclampsia, infection and hemorrhage.

The student is taught that posterior positions occur more frequently than is often thought. The mechanical differences in anterior and posterior positions are usually due to a failure of flexion in the posterior position. Engagement in most anterior positions is usually present in primipara at the onset of labor, a contributing factor toward anterior rotation. In posterior positions, the biparietal diameter lies posterior to the plane of the oblique diameter, impinging upon the promontory preventing flexion, a mechanical obstruction favoring posterior rotation. To overcome this, prenatal care preventing excessive gain in

weight, exercise to develop abdominal muscles, and proper elimination all tend to improve the health and influence regular, strong and active uterine contractions. The force from these active contractions of the uterus will favor flexion, which, in turn, will tend to induce anterior rotation. We teach the student that the patient should rest during the first stage of labor and that he should intelligently observe the progress of labor with a minimum of interference. There is a tendency among students and recent graduates to display an eagerness to interfere with a normal delivery because they do not comprehend normal labor and because of a desire for the spectacular. We find that version, or the internal rotation of the anterior shoulder, are rarely necessary. When it is necessary to resort to these measures we emphasize that these are major operations and should be conducted under the strictest technic. The sense of personal responsibility and personal adequacy are of vital importance in teaching obstetrics for full rounded development.

Eclampsia rarely occurs in the patient who has had intelligent prenatal care. Our students are taught that the patients should visit the Clinic each week where they may be seen, weighed and have their blood pressure recorded. An increase of fifteen pounds over standard weight usually means an excessive diet. That diet which will sustain the patient for ordinary duties is usually sufficient during gestation. Excessive gain in weight causes an increased blood pressure, edema and other pre-eclamptic symptoms, which indicate immediate and intensive treatment. This is the ideal time to treat eclampsia. However, in the convulsive type, we advise treatment of the condition and later care for the delivery. Treat the actual condition by morphia to control the convulsions; venesection to reduce the blood pressure; gastric lavage, leaving in the stomach two to three ounces of castor oil; and high colonic irrigations of two to three gallons of water.

Puerperal infection is usually the result of poor technic and a failure to apply simple rules of asepsis. The student should know that the same rules of cleanliness and sterilization used in surgery must also be used in obstetrics during delivery. A clean appendectomy followed by infection is similar to a normal delivery followed by infection, either of which is an indictment of the technic. The student must be taught to realize his responsibility to his patient and to the public, and diligently to execute the technic in preparation for and during delivery. The treatment of puerperal infection is: rest; abundance of fresh air; wholesome, nourishing food that is easily digested; avoid drugs that will disturb gastric condition; limit vaginal examinations, and palpate the pelvis externally for subinvolution, tenderness or masses; inspect the vulva for wounds, and if there is evidence of infection, remove stitches; apply silver nitrate, 10 per cent, to ulcers; ice bag to abdomen; modified Fowler position; encourage sleep; warm or cold sponges for temperature 103 Fahrenheit; mild laxatives or enemas; and plenty of water.

Post partum hemorrhage is usually preventable. We emphasize the contributory factors which cause hemorrhage: exhaustion, distended bladder, failure to inspect the placenta and membranes at delivery to know of their retention, and a poorly conducted third stage. It is a poorly conducted third stage of labor where the uterus is kneaded and a sufficient length of time is not allowed for the separation of the placenta and membranes before expulsion. Crede's method is not used unless positively indicated. Students are taught that they must wait, unless emergencies exist, until they are reasonably sure of the separation. Only in extreme cases must the uterus be invaded, and then under the strictest aseptic conditions. Packing of the uterus with gauze is not resorted to except as a means of dire necessity.

Placenta previa is an indication for emptying of the uterus. Hemorrhage, in the last trimester, without pain, probably means low implantation of the placenta. If, upon vaginal examination, the placenta is palpated, and is central or partial, cesarean section is justifiable under proper surgical conditions. These cases should be treated in the hospital; but if in a home and surgical assistance cannot be secured, then a vaginal pack is warranted. Rupture of the membranes after partial effacement and dilatation, together with abdominal binder, may control the hemorrhage; but failing at this, podalic version may be done. In the treatment of all placenta previa cases, preparation should be made in advance of the delivery to prevent and treat post partum hemorrhage. In the treatment of placenta previa, irrespective of the method, the student must be taught that these cases are potentially suited for infection. He must bear an extra responsibility.

As teachers, we must impress the undergraduate student that to carry wisdom to the people is something worth while, and that results demand a high order of skill and courage. The people are understanding the reality of preparation in obstetrics, as in diagnosis, surgery and preventive medicine; hence, they appreciate its worth and practical usefulness. We should teach the undergraduate medical student each thing thoroughly and insist that he carry this knowledge into action rather than teach him many things unsystematically and in such a manner that he fails to have a keen intellectual interest. Each year makes higher demands. This is because the nation is growing more critical. It is

beginning to demand fitness. The opportunities it has to offer are falling into the hands of trained men, and these men demand still higher training from those who are to be their successors.

It is the student who knows who has the right to act, and to act competently he must be taught one thing well that he may do it well. This can be done in obstetrics where practical methods are used in teaching the undergraduate student to see things as they are and to have confidence in himself, fighting for objects of worth and expressing a fellow feeling towards all men.

DISCUSSION

Dr. Edward Speidel, Louisville, Ky.—There is a tendency in medicine at present to limit didactic teaching. I think obstetrics differs from the other branches of medicine in that a very thorough didactic course in all the various points is necessary. Obstetrics is largely a mechanical procedure, surgery even more so. In surgery, with the abdomen opened and everything in view, the technic of the operation can be clearly demonstrated and taught. In obstetrics you have the closed abdomen and closed uterus. No matter how often the student sees a version he will be an absolute novice when the time comes to perform his own first version. He will not have that feeling of security that the experienced obstetrician gets after he has had his hand inside of a uterus for a number of times. He will not be able to perform that version unless he has definitely in his mind all the various steps of the version that have been taught him carefully in the course of the didactic lectures. Consequently, in our institution we teach the students very thoroughly in lectures throughout the senior and junior years. These lectures are illustrated with lantern slides taken from the various text books and then demonstrations are given on the mannikin besides.

It must not be forgotten that these students must pass a state board examination. The pathological features of obstetrics can be taught only in didactic lectures. However, supplementing this a very practical course is given. The students are taken in sections through our large hospital and are able to witness ordinary and operative obstetric cases, and the various complications of labor that happen to be present in the hospital. We have, we think, one of the best prenatal clinics in this country, and it is a significant fact, as stated by the essayist, that those cases that have prenatal care very rarely suffer the graver obstetrical complications. In our experience in two years not a single case of eclampsia that entered our hospital had prenatal attention in the clinic.

Dr. J. P. Litzenberg, Minneapolis, Minn.—The essential thing in all clinical teaching is the student's contact with the patient. The next essential is that his contact shall be with the men in the upper brackets of teachers and not exclusively with the so-called younger men. We have tried to work out a greater contact of the student with the patient, and it is done by clinical clerkships in which the student is responsible for a certain case from its beginning, the prenatal care, delivery, and after care, being held responsible immediately by the interne. Immediately over them is the teaching fellow, who is a graduate student, a man who is a candidate for Ph.D., a man who is the responsible house staff man. The contact with the chief of the department is such that no complicated case is allowed to be treated in the hospital without the full knowledge and direction of the chief of the department. The chief of the department even sometimes delivers a normal case for the students and condescends to do a perineal repair. Of course, that is beneath the dignity of the chief of the department, but he has sometimes sacrificed his dignity in the belief that the students are entitled to some teaching by the professors.

In the prenatal clinics our experience has been the same as the last speaker's. We have been able to trace few cases of eclampsia among our prenatal clinic patients. All other cases of eclampsia are those who have not had prenatal care. The only thing I have against prenatal care is that it destroys our eclampsia clinic, but we shall have to forego that.

I detest the word didactic because any one who gives the so-called didactic lecture and does not give it with clinical teaching is not teaching properly. In all branches we are trying to teach too much. Something must be left to future study and to graduate work. Didactic teaching needs to be reorganized. In order to reorganize the class room, the chief of our department is teaching every course that is given in the department seriatim in order to boil down to an irreducible minimum and in order to give a clinical trend to all of the teaching.

A most important point is that the hospital should give to obstetrics its just share of beds. In the University of Minnesota we have exactly 50 per cent of our share, according to the Council of Medical Education of the American Medical Association. That is due to the fact that the Professors of Surgery and Medicine originally assigned the beds. A case that is well taught with the student in constant contact with the patient in the hospital under the interne, the teaching fellow, the junior staff man and the chief is worth more than ten cases in the out-patient department where proper supervision is more difficult, and my plea would be for the medical schools to give proper place to obstetrics, a major subject which should not be put in the attic. What is left is usually given to obstetrics.

A most important thing is the contact of the student with the patient from the beginning of pregnancy.

Dr. Hannah (closing).—Medical schools should not teach obstetrics as a minor subject when it is classified as a major subject. It should be on par with medicine and surgery both in teaching

and classification. Facilities for teaching this subject should be adequate and properly equipped so that the spirit of this branch would permeate every student connected therewith. Students in this department should bear responsibility under proper leadership, which is the avenue for individual thinking.

THE TEACHING OF PALPATION AND PERCUSSION IN PHYSICAL DIAGNOSIS OF THE THORAX*

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Judging by the usefulness of palpation and percussion of the chest to the recent graduate in medicine, we should conclude that there was some grievous flaw in the methods by which they are taught to most students of medicine. Observation of most young doctors at work in thoracic examination leads us to believe that they put more reliance on the stethoscope than on data obtained from both these procedures combined.

We find students trying to make themselves proficient in the differentiation of variations of pitch who are unable to whistle the simple air of a song. Whether it be due to a lack of musical training in childhood or to a hereditary deficiency of tone perception, the fact is that the average of our students lacks a musical sense. A system of instruction that involves essentially a dependence on such a sense must fail in its results until such development has come through training. There is no time in a medical course for such training. We can only sow the seed and hope for growth in the future, knowing in advance that some of the seed will fall on barren ground.

Auenbruegger, in 1761, originally described the qualities of sounds emitted over the organs during percussion as, high or low, clear or muffled, even to obscurity. Adding to this, he called attention elsewhere to the necessity of comparing the reaction of the chest to a similar percussion stroke in symmetric regions of the two sides, and pointed out inequality of response in sound production as an evidence of disease. To the above, something has been added since his day. Duration of percussion sound is a quality which gives us valuable information. With this addition and with the perception of resistance we have probably included all that is of real value up to quite recently in considering percussion phenomena.

The study of resistance to the plexim:ter finger is now considered a necessary part of percussion and its relative value as a factor compared with the sound emitted varies with different observers. Resistance is not the only impression that the pleximeter finger receives. There is a sense of vibration that becomes with practice, more and more acute, until with proper technic they are merged with sound vibrations in a perception complex, the sum of which is noted.

In order to perceive these vibrations through the fingers it is necessary that the percussion stroke shall be minimal, i. e., the lightest possible blow that will give any vibration response in an area usually resonant. To preserve this minimal stroke, it is always necessary to adjust the force of the blow in different regions. Usually it is in the direction of lightening the force used that adjustment is to be made. Contrast is the aim and contrast is always greater between a stimulus of zero degrees (silence as to auditory perception) and stimulus of the first degree than between even a first and second degree stimulus. The psychological law of "least perceivable difference" was established by E. H. Weber in 1830 and is the basis for the threshold idea. A light of one candle power flashed in the dark at a distance of one hundred yards gives an impression of greater contrast than one would get between a light of say, twenty-one candle power and one of twenty-two candle power flashed under the same conditions. As the stimulus increases the "least perceptible difference" diminishes. This is Weber's law and it has been proved to apply to all of the complex sensory perceptions utilized in physical diagnosis. It was originally worked out upon the skin by varying the pressure by weights. It has been found to apply also to auditory perception.

Following this concept which has stood the test of nearly a century, one gets an enormous help in lightening the burden of the student and teacher by insisting always at the beginning of the course of instruction that the "threshold" idea be carried out. Threshold percussion as described by Goldscheider has found its way into some of the accepted text books; but usually the significance of the concept is lost in a description of a more or less "bizarre" technic used by Goldscheider. We read that the method is of value in topographical percussion, for example, to determine the borders of the heart or liver. The fundamental underlying psychologic principle is overlooked. We find the students struggling bravely to find a means of applying the laws of physics without the incentive of material accomplishment to spur him on and to preserve his interest. Threshold percussion is usually mentioned to the student as a procedure which is of casual interest and sometimes used. Let us recog-

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nize its true basis and show him how to utilize its principle. Then all of his subsequent work in percussion and palpation will be made easier.

If the thorax is struck over any of the so-called resonant areas by a blow that is the lightest possible to produce any vibrations at all, there is in addition to a sound produced, a complex touch perception which is made up of a combination of sensations involving superficial and deep touch sensations, muscle and joint sensations. These latter are brought into play as the fingers and hand are moved in varying degree of rapidity in the recoil. The thorax behaves in the main as a bell which is thrown into vibration by a blow. I have frequently used as a model to demonstrate percussion a glass bell-jar against the inner side of which a mass of putty was made to adhere. The putty covers a segment of the bell and represents in its mass the anterior mediastinal segment of the thorax containing the heart. It is quite easy with a very light stroke from a rubber hammer to locate the putty with accuracy. With the lightest blow, the bell rings when struck in the free portion only. The same blow over the putty fails to give the initial impulse and there is silence. Fingers placed anywhere over the bell get the impression of vibration always when vibrations occur. The failure to elicit audible and tactile vibrations indicate an increase of mass under the percussion points. This idea of determining mass or density in the underlying parts is what we wish to impress upon the student. Inertia is proportionate to the mass and varies as the mass. Regions of the thorax where we fail to get vibrations perceptible to the plexi-meter hand, and perhaps to the ear, are those where the mass is greatest. Vibrations vary with the inertia. If the thorax is struck a blow of just sufficient force to cause to vibrate regions which are normally resonant, and the resonance is not manifest, there is evidence of underlying increase in density or mass. Increased or decreased density is an indication of disease. If the area shows by an abnormal swing into vibration to the blow, an exaggeration of vibration, we can conclude that, on the other hand, there is underlying less than normal density or mass, due likewise to disease.

The normal boundaries between the solid organs which lie in contact with the lung offer the best drill for the student upon which to practice this method of topographic percussion. It is of utmost importance to impress upon the student that the two fingers, the percussing finger and the plexi-meter finger, constitute together an instrument whose force must be adjusted to the region struck. This adjustment must be carried out in advance over normal lung tissue and the force of the stroke regulated to elicit minimal vibrations over this region. If this is done and the adjusted instrument is carried toward a certain region to be tested, and no vibrations are obtained, either a normally existing mass has been encountered or there is abnormal density. The use of the skin pencil is essential to mark the point of lost vibrations. Repetition of the procedure from varying points in a direction always toward the area of lost vibrations gives a series of points, the boundary line of the denser organ or that of the increased mass in the thorax due to disease. Practice of topographic percussion on the normal subject may well consist in the laying out of the right and left borders of the heart, the lung-liver boundaries, the super-clavicular areas of Kroenig. The lower borders of the lungs during inspiration and expiration, respectively, constitute the best possible exercises for the beginner in this method of minimal (threshold) percussion. This can very well be given in the second year.

If the lines drawn on the chest wall are marked by the skin pencil, the instructor can verify them. If flattened shot on adhesive plaster discs be placed on these points and the observation can then be checked with the fluoroscope, this verification will serve to stimulate the student's interest in his work. He must realize that the roentgen ray is but another method of determining differences of density, but distinctly supplementary to the very delicate method which his own hands as an instrument afford. He must be taught to trust his own impressions and to strive ever for new refinements in receiving and recording them.

A few suggestions as to how to demonstrate the minimal blow to be employed over a normally resonant area might be of assistance. Comparatively few teachers quite realize how very light a stroke is meant by minimal. It is convenient to designate as light, a stroke which gives no audible sound at a distance of over six inches from the ear. I have found it convenient to ask the student to place and to keep the palm of the percussing hand in contact with the back of the wrist of the plexi-meter hand, eliminating entirely movement of the wrist. A little training of the percussing finger away from the patient may be needed to get a satisfactory instantaneous stroke with the quick rebound of the piano hammer. I have several times in a half hour's time taught, by this method, children of fourteen years to mark the right heart border within 1.0 to 1.5 centimeters of where a skillful examiner would place it. This is impossible in medical students who have witnessed the "strong-arm" method which some of our fraternity believe is light percussion and teach as "light percussion."

I am in no sense pleading for the universal application of light instead of heavy percussion, but only for the easiest way to place the student on his feet in palpation and percussion. Heavy percussion requires the experience of years to master and results are to be interpreted only by a

most careful analysis of the sounds evoked. The comparison of minute differences of pitch, quality, loudness and duration becomes necessary with heavy percussion, and also our students have usually left us before they are able so to analyze these sounds. The minimal vibration method gives them, in a very short time, a real basis upon which to build the more elaborate structure upon which he may reach later to even the heights of the physics of sound.

One of the great difficulties encountered in the teaching of physical diagnosis arises from nomenclature. One of us reads a description of a physical sign, looks for it in his patient, and finds what he believes to be the sensory perception complex which the original observer had in mind. This sensory complex he fixes in his own mind and that of his students.

There is no practical method for the making of records of vibrations of sound-waves or of the swing of the chest wall during palpation or percussion which may be handed over to another as a standard. The cardiophonograph is not yet generally available and the flame monometer is still a physiologic laboratory equipment. Difficulties are multiplied by faulty teaching. Intricacies of theory are introduced into the subject which the student tries to master. What is perhaps the best text book in existence in the English tongue on the subject of chest diagnosis utilizes page after page in discussing the acoustics of the chest and we see even an attempt to name the notes occurring as fundamental tones in the varying degrees of dullness obtained in percussion of the thorax. On another page of this work, discussing tympany, we find a discussion of the difference between rhythmic and arrhythmic vibrations as the underlying causes of tympany and resonance, respectively.

The authors have rendered an invaluable service to teachers and to the student in embodying such a physical basis in a book readily available and really encyclopedic in its scope. However, it is to be hoped that in the study of such a book teachers will read with the student and point out the fact that such a discussion is desirable from an academic standpoint, but not essential to the practical mastery of auscultation and percussion. The great master musicians of a half century ago probably worked in ignorance of the greater part of this department of physics. A great composer of today would probably be helped by such a knowledge; but a beginner in music, for example, would get little but discouragement from such a study. Far be it from me to deprecate the study of the fundamental sciences of any branch of medicine.

It is far less difficult to bring the student to perceive the abnormal conditions revealed by auscultation. The teacher hears an altered voice or breath transmission or a collection of rales in a certain region or an abnormality of the heart sounds and points it out to students, naming and describing the finding. The student hears in turn and recognizes the sounds. Soon these characteristic normal or abnormal sounds are fixed in his mind and he learns to find them for himself and to identify them to his great satisfaction and joy.

In the case of palpation or percussion, the circumstances are quite different. Much more depends on the muscular effort expended by the examiner and the practice is more complex than is involved in placing the ear or stethoscope against the chest and listening for sounds produced outside of himself and of a quality not to any great extent alterable by him.

The student must not be overwhelmed at the outset by theory. The prowling marauder in a melon patch easily distinguishes the ripe from the green melon in the dark by a simple percussion without any knowledge of the underlying acoustic difference and without any concept whatever of fundamental tones and over tones, rhythmic or arrhythmic vibrations coming from the material examined.

Percussion of the chest is almost as simple. The dense area of the heart lying in between two cellular structures or an area of consolidation in the lung itself offers a contrast similar to that which exists between the ripe and the green fruit of the vine.

Palpation of the thorax has made much less progress than either auscultation or percussion in the hands of the profession at large. The subject is apparently exhausted when the student is taught to recognize fremitus, voice, bronchial, pleuritic, and pericardial thrills accompany the heart-beat; and the position, extent and force of the apex beat of the heart. Auscultation and percussion have each a large and exhaustive literature. In both these fields the master's voice has been heard and we have recognized for all time the influence of the two geniuses who have created the two respective arts. Palpation of the abdomen is apparently a richer field. This is due to the meagerness of data furnished by the other physical signs. Abdominal palpation is one of the most valuable methods of securing data upon the state of the abdominal organs yielding data as to position, size and existing tenderness, if any, in some of the larger and denser organs in the abdominal cavity. The degree of muscle-spasm in the abdominal wall resulting from disease in the abdominal organs is taken as a matter of course and receives a routine investigation in every careful general physical examination. Most physicians overlook completely the possibilities of palpation of the chest to reveal disease of mediastina, heart, pericardium, lungs and pleurae. We know that there are, accompanying disease of the abdominal vis-

cera, definite and clear-cut reflex effects involving muscular contractures and sensory reflexes segmental in their distribution. In the case of disease of the thoracic viscera whose association with the cord is known and recognized, it is unlikely that these reflexes should be found lacking. The reflex muscular contractures in the muscles of the neck and thorax furnish even a richer and more vivid picture of visceral disease than is found in the state of the muscles of the abdominal wall in abdominal disease. The boundaries of organs and variations in density due to disease in the organs of the thorax are quite easily determined to the trained hand with light-touch palpation. More data upon the condition of the thoracic organs can be obtained by palpation alone than palpation of the abdomen yields in abdominal disease. Pottenger called attention to this fact about ten years ago, but it seems still far from general acceptance. The technic resembles in a way that of minimal or threshold percussion. It involves a touch with the pulp of the palpating finger "so light as hardly to dent the skin" and a concentration of the attention upon the sensations received. It is probable that even this light touch sets up vibrations that are felt. Whatever be the nature of the phenomena elicited, it is certain that the outlines of organs and differences in density of the lungs and pleurae can often be located with as great a degree of accuracy as percussion gives.

It is important to develop the compound perception, the so-called sense of touch in the student, to this and other uses. The systematic comparison of the muscles of the neck and chest by palpation of the gentlest sort offers a splendid drill to this end. The only skeptic who can remain unconverted to the importance of this muscle palpation is he who refuses to investigate for himself, to prove or disprove. Palpation of the muscles of the thoracic wall done after this method of very light touch will bring conviction of the value of the method.

This is not the time or place to introduce a controverted question. I am suggesting the teaching of this light-touch palpation as a means of sharpening the sense perceptions of the student, knowing that he will be rewarded by an improvement in percussion and also in his increased ability to see with the eye evidence of the same muscular phenomena he feels with the fingers. He will be led to account for these phenomena and will be carried into study of visceral reflexes which, from the standpoint of clinical medicine, are most important and unappreciated by most physiologists, neurologists and clinicians.

CONCLUSIONS

The student is bewildered by the attempts to teach differences of tone in his beginning work in percussion. If the percussion stroke is so lightened as to be just within the threshold of audible and palpable vibrations in a resonant area, the task of student and instructor will be lightened. Contrasts from low-degree stimuli are more easily perceived than contrasts from stimuli of higher degree with the same common difference.

Percussion is, in a large part, palpation. This fact requires more than the usual emphasis in instructing students. Independence of outside noises comes to him when this fact is realized through practice.

Palpation of the thorax as hitherto generally taught has not received the attention that its value justifies. Much information can be thus obtained. The light-touch technic is essential to such a palpatory examination of the thorax. The student is able to see with his eyes, after experience with this method, many changes which formerly went unnoticed. The field of inspection is also widened by effort directed toward development of the so-called touch sensation.

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Eighteenth Annual Meeting, New Orleans, La.
November 24-27, 1924

SCARLET FEVER CONTROL

During the past twelve months much has been learned regarding the etiology, nature, treatment and probably the control of scarlet fever which is so widespread in early childhood and during the first half of life. In rapid succession have come announcements from various sources of one or another feature of the disease which reveals its etiologic relationship to a specific type of streptococcus. Promise is also given that material will be available for specific treatment of the disease. A matter of greater importance is that this material can be used to immunize permanently susceptible individuals, and in this way control the incidence and spread. At present the work is undergoing a process of trying out to demonstrate its practical and efficient use.

Working independently, two groups of investigators, Dochez,[1] at the Rockefeller Institute, and Dick,[2] [3] at the McCormick Institute, have demonstrated the etiologic relationship of scarlet fever to the streptococcus hemolyticus, an organism which can be cultivated from the throats of patients suffering from scarlet fever. Pure cultures of the organism when swabbed in the throats of normal susceptible human volunteers cause an illness resembling clinical scarlet fever. Culture produces in the guinea pig likewise a reaction of fever, illness and a rash in the skin followed by desquamation and recovery.

The bacterial filtrate from these organisms has been used to produce a serum in horses which when injected into the skin which shows a scarlet rash will cause an area of blanching which persists throughout the duration of the rash.[4] [5] Serum so prepared when given intramuscularly has therapeutic value for humans suffering from the disease, terminating its course by immediate crisis with subsequent recovery.[6] [7]

Dick has shown that when proper amounts of this bacterial filtrate are used a test may be devised to show who may or may not be susceptible to the disease and that when one is found who is susceptible, the individual may be immunized.[8]

The results show that in many respects scarlet fever bears much resemblance to diphtheria, a disease which today is destined to disappear as plague, cholera, small pox, yellow fever and other diseases are doing.

It is interesting to note that these results have been accomplished by well conceived and executed research carried on by a group of untiring scientific workers with the end in view of discovering the cause of scarlet fever and of producing a way of curing or preventing the disease. The funds to be used in carrying on the study by one group of workers were made available through the Harold F. McCormick Memorial, an institution established in memory of a child victim of the disease.

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1. Dochez and Sherman: Significance of Streptococcus Hemolyticus in Scarlet Fever. J. A. M. A., 82, 7, 542, 1924.
2. Dick: Experimental Scarlet Fever. J. A. M. A., 81, 1166, 1923.
3. Dick: Etiology of Scarlet Fever. J. A. M. A., 82, 265, 1924.
4. Dick: Skin Test for Susceptibility to Scarlet Fever. J. A. M. A., 82, 265, 1924.
5. Toomey and Nourse: Extinction Tests in Scarlet Fever. Amer. Jour. Dis. Child., 27, 95, 1924.
6. Blake, Trask and Lynch: Observations on Treatment of Scarlet Fever with Scarlatinal Antistreptococcic Serum. J. A. M. A., 82, 712, 1924.
7. Herrold and Tunnicliff: Concentrated Scarlatinal Serum. Jour. Inf. Dis., 34, 209, 1924.
8. Dick: Scarlet Fever Toxin in Preventive Immunization. J. A. M. A., 82, 265, 1924.

VESICULAR DERMATITIS OF THE FEET CAUSED BY MOULDS

There are few of us who have not cracked a chestnut only to find the kernel replaced by the mould of a fungus. Every one is familiar with the little green plants of the lower order which are to be found upon stale, damp bread in the kitchen. But that numerous species of these vine-like plants thrive in human tissues at times, thereby inducing inflammatory reactions, is a fact often forgotten. One of the most common of these seldom recognized forms of ringworm, or epidermomycosis, is frequently seen by every practitioner in the Southern United States. It appears upon the soles of the feet, and sometimes upon the hands, masquerading in diagnosis under such titles as "eczema" or "pompholyx," its cause being assigned to everything from the dye of socks or shoes to nervousness.

The affection has several clinical manifestations, depending upon favorable growth conditions and the type of mould. Those most often met are deep seated, rather large, vesicles on the soles or the sides of the feet near the glabroplantar line, occurring either discretely, and scattered over the soles, or in patches which may exhibit central involution with new vesicles of a more recent attack upon the periphery. This frank eruption is usually accompanied or preceded by irritation on the sides of the toes. A large percentage of cases of raw, itchy toes and of deformed, diseased toe nails, is due to this fungus. Outbreaks occur in crops during hot weather, warm, moist skin favoring growth of the tiny colonies whose sites are marked by vesicles. After rupture of the vesicles, crusts appear. With winter the disorder becomes quiescent, the spores or seeds remaining to sprout with renewed vigor the following spring.

Diagnosis depends upon clinical familiarity with the disease and detection of the filaments of the mould in the tops of the vesicles, either by the microscope or by cultural methods. Complete eradication of the disorder has offered difficulties, the treatment, according to dermatological literature, being rather unsatisfactory. A paper by Andrew L. Glaze* describing a successful method of attack is to be found in this issue of the JOURNAL.

BORDERLINE DIETARY DEFICIENCIES

The much talked of and clinically recognizable dietary deficiency diseases are xerophthalmia, a form of conjunctivitis not often seen in the advanced stages because the animal rapidly dies while the disease is developing; beriberi, a form of polyneuritis marked by spasmodic rigidity of the lower limbs, muscular atrophy, paralysis, anemia and neuralgic pains; scurvy, marked by weakness, a tendency to mucocutaneous hemorrhages and a brawny induration of the muscles of the calves and legs; and rickets, in which the predominating symptom is the bending and softening of the bones.

Each of these must have an early stage in which the dietary deficiency is not complete and is marked by indefinite and inexplicable symptoms. It has been shown that there is a minimum of vitamin which an animal must have for life and growth, and it is known that he can have too much.

Sherman and Campbell[1] reared two sets of rats through several generations: one set, on a diet consisting of one-sixth whole milk powder and five-sixths whole wheat powder, which he called diet A; and the other set, one-third whole milk powder and two-thirds whole wheat, called diet B. The rats on diet B, which contained twice as much milk, had a greater average weight, the females were more fertile, began reproducing earlier and their reproductive period was longer. The authors conclude that a greater average weight was maintained, a longer period of ma-

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*Glaze, A. L.: A Treatment of Epidermomycoses of the Feet and Hands, p. 643, this issue.

1. Sherman, H. C., and Campbell, H. L.: Improvement in Nutrition Resulting from an Increased Proportion of Milk in the Diet. J. Biol. Chem., 60, 5-15, 1924.

turity was enjoyed, and that the senility period began later than in the rats on a lesser milk ration.

Another experimenter[2] fed puppies on a skimmed milk diet which contained enough of vitamin A for maintenance but not for growth. The animals showed marked pathology of the thyroid gland as well as striking bone lesions. Here is a possible explanation or a field for investigation of some of the endocrine disturbances of childhood.

Deficiency of vitamin A has been shown to be followed by inflammatory changes in the sinuses and mucous membranes and to affect vision.[3] Pigeons in the early stage of polyneuritis have been shown to have lesions of the gastro-intestinal tract. These are only a few examples of beginning pathology from a deficient diet.

As vitamins A and D are fat-soluble, they are usually diminished in milks which have been preserved by any process. This fact should be borne in mind in infant feeding.

To select the optimum quantity of vitamins for each animal species, particularly the human species, is a difficult problem, and the ability to recognize the fine maldevelopments which may follow a barely insufficient vitamin intake would help in the diagnosis of some obscure minor complaints. Many of the headaches, digestive disturbances, muscular atonies, or small disorders seen commonly in private practice, with which the patient lives but on account of which his efficiency is impaired, might be traced back to an inadequate diet during some period in his life.

Research on the pathology of borderline dietary deficiencies may in the future add greatly to the profession's understanding of the etiology, prevention and treatment of the minor as well as the major discomforts of mankind.

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2. Davis, Marguerite: Effect of Rations Containing Whole and Skimmed Milk on Young Growing Puppies. J. Met. Research, 3, 5-6, May-June, 1923.

3. Editorial: So. Med. Jour., 17, 141, 1924.

HOTELS FOR NEW ORLEANS MEETING

To avoid confusion and to be sure that all will be comfortably taken care of, the Hotel Committee urges those who contemplate attending the New Orleans meeting, November 24-27, to make hotel reservations in advance of the meeting, and the sooner the better.

Below are the names and rates of the leading hotels approved by the Committee. They are all in the down town section and the farthest is within a few minutes' walk from all of the section meeting places. Reservations may be made direct with the hotel or through Dr. J. C. Menendez, P. O. Box 1460, New Orleans, who is Chairman of the Committee on Hotels. If you write to the hotel direct and do not hear within a reasonable time, write to Dr. Menendez, who will take great pleasure in seeing that a comfortable reservation is made for you. Be sure to state the day the reservation is to become effective and if possible give the time of the day you expect to arrive.

New Orleans, "City of Hospitality," wishes to be host to a great number of physicians from the South, November 24-27.

HOTELS AND RATES

ROOSEVELT HOTEL (General Headquarters)
(Formerly Grunewald—new ownership, new management)
Single room with bath, $5.00-$6.00.
Double room with bath, $8.00-$10.00.

BIENVILLE HOTEL
(Roosevelt owned and operated)
Single room without bath, $3.00-$3.50.
Double room without bath, $4.00-$4.50.
Single room with bath, $4.00-$6.00.
Double room with bath, $6.00-$8.00.

ST. CHARLES HOTEL
Single room without bath, $2.00-$4.00.
Double room without bath, $3.50-$7.50.
Single room with bath, $3.00-$7.00.
Double room with bath, $6.00-$12.00.

DeSOTO HOTEL
Single room without bath, $3.00.
Double room without bath, $5.00.
Single room with bath, $5.00.
Double room with bath, $8.00.

MONTELEONE HOTEL
Single room without bath, $3.00.
Double room without bath, $5.00.
Single room with bath, $5.00.
Double room with bath, $7.00.

LAFAYETTE HOTEL
Single room without bath, $2.50-$3.50.
Double room without bath, $3.50-$4.00.
Single room with bath, $3.50-$5.00.
Double room with bath, $4.00-$8.00.

LA LOUISIANE HOTEL
Single room without bath, $2.00.
Double room without bath, $3.00 up.
Single room with bath, $2.50.
Double room with bath, $3.50 up.

Our Convention City

SANDY SEES NEW ORLEANS

III

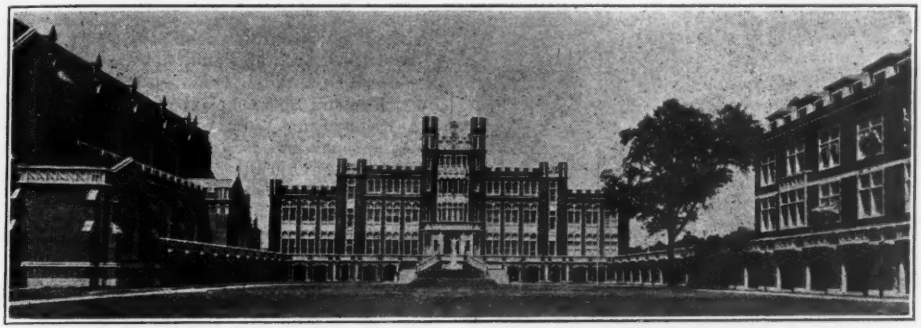
NEW ORLEANS AS AN EDUCATIONAL CENTER

Audubon Park with its beautiful oaks, its shady walks, its promenades, its wading pool and lakes, faces one of the most handsome spots in the city, Tulane University and Loyola University, the hub of college life in the city. Around this center, extending backward for over a mile and several squares in width, are clustered the principal higher educational institutions of New Orleans, namely, Tulane University, Loyola University, Sophie Newcomb Memorial College for Women, Ursuline College for girls, and the Sacred Heart College for girls—all within easy walking distance of each other or adjoining.

This does not mean that all educational factors are centered here, as witnessed by the fact that the higher branches in medicine are taught miles away at the Hutchinson Memorial Building on Canal Street and at Charity Hospital, two squares away from the latter; and that Loyola has its lower classes taught on Baronne Street, a square away from Canal Street, the hub of New Orleans.

But higher education, nevertheless, is centralized on St. Charles Avenue, opposite beautiful Audubon Park. This felicitous combination makes one wish one were in college to roam at large in these enchanting domains of art and Nature, education and science. Education has made gigantic strides in New Orleans to reach its present eminence, ranking with the highest educational centers in the land. Carried forward by the enthusiasm of its people, and backed by the faith and sinews of John McDonogh and Paul Tulane, educational facilities, like little Topsy, "jes' growed up." New Orleans, dealt a staggering blow by the Civil War, which had sapped its vitality and its funds, again became the victim of the carpet-bagger regime, when education of necessity became second to the struggle for life, liberty and individual assertion. But this cloud, like all others of its ilk, finally folded its "tents like the Arabs" and passed away. Education, Phoenix-like, now arose from the ashes and was reborn.

Here the influence of McDonogh and Tulane was felt in assisting New Orleans to climb its educational heights and attain its footing among its peers. With Colleges of Arts and Sciences, Medicine, a College of Tropical Medicine, Colleges of Engineering, Dentistry, Pharmacy, Midwifery, Law, Graduate Colleges, Newcomb College for women, Ursuline and Sacred Heart College for girls, Tulane and Loyola have spread a panoply which is difficult to surpass. With these colleges and hospitals, ranking Class A-1 according to accepted educational standards, New Orleans, with its nearly 100,000 students and pupils, ranks high in educational centers. Its seismographical laboratory and other laboratories, its work in the Maya Institute, its museums, gymnasiums and its libraries are on a par with the best. The Orleans Parish Medical Society alone has a medical library of over 11,000 volumes, which, combined with that of Tulane University, situated in the same building, more than triples this figure.

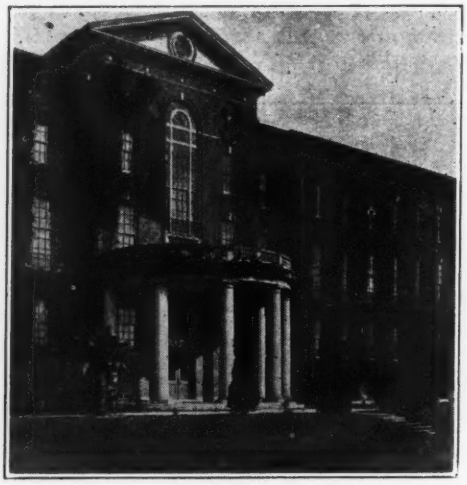


Loyola University

A shimmering spider web, glistening in its radiancy when cut athwart by a shaft of light stealing through an old cathedral window, can hold no beauty equal to the splendor of the devotion which made this education possible, the love for and faith in their land of adoption shown by John McDonogh and Paul Tulane. Nor can the death menace to an unwary fly caught in this web of beauty parallel in its destructiveness the influence of the Civil War and its aftermath on the advancement of education.

John McDonogh, born in the latter part of the Eighteenth Century, having felt the effect of the blighting hand of religious difference on the romance of his youth, spent the remainder of his life acquiring a fortune, which, upon his death, was equally divided between the land of his birth, Baltimore, and the land of his adoption, New Orleans. When his ship of Romance with Micaela Almonaster y Roxas was wrecked because of differences resulting from caste and religion, he closed his beautifully furnished home, where he had so lavishly entertained, and entered upon a form of life which can best be illustrated by one of his precepts, "Never spend, but to produce." The fruit of this life's work is before you today.

Paul Tulane, although only moderately educated, gave his fortune, which had been made principally in New Orleans, to the advancement of local education, because his pride in the land



. Sophie Newcomb Memorial College

of his adoption was too great for him to see her sons sent to other places for their training. With such a spirit to actuate him, he proved that he was one of Nature's noblemen, God's chosen.

Education in this city is too broad a theme to be handled in one article, so that if you will stroll along with me and not question my moods, I shall show you here and there high lights which stand out boldly, and let you on your visit during the Convention take in the picture at your leisure. We are now at the Charity Hospital, one of the greatest medical educational centers in America, engraved deep into the marble of the Halls of Fame. From its portals the best in the field of medical education have marched forth to disseminate medical lore over the universe. Within its walls more pain and suffering have been assuaged than was caused by the great wars.

Sacred in the memory of the suffering, honored in the minds of the medical world, it was erected in 1784 and rebuilt in 1816 after having been destroyed by a conflagration. It has marched on, ever onward in its ministrations to the suffering and its contributions to medical learning. Even during the war when the invading army from the North attempted to convert it to its own uses, it carried on—carried on under the hand of the highest light in our picture of education, the house-surgeon of Charity Hospital at that time and an educational factor ever since; not only a source of light and education to men entering the medical fields, but a pioneer in surgery and a guiding hand to medical beginners. Were the question suddenly propounded what are the leading factors in medical education in New Orleans, every man would say, Charity Hospital, Tulane University and Ernest S. Lewis.

Charity Hospital, Tulane University, Ernest S. Lewis—all here today as they have been for the past eight decades, each improved by time and brought to a higher degree of functioning through the forces and influence of education, directed by the influence of soldiers in the army of education, such as Rudolph Matas, A. B. Miles, Stanford E. Chaille, Isadore Dyer, John B. Elliott, Edmond Souchon, James Jones, Tobias Gibson Richardson, Warren Stone, Samuel M. Bemiss, Joseph Jones, Samuel Logan, Frank Hawthorne, P. E. Archinard, C. C. Bass and others whose work has been pioneering and not infrequently international in its importance. Such, for instance, was the work on circulation which marked a departure in aneurysmal surgery.

Most of these soldiers in the ranks of education are now answering the roll call in "Fame's eternal camping ground, the bivouac of the dead," but their teachings and precepts are still blazoned forth by those of them who yet actively carry the banner, adding daily to the glory of achievement. Intermingled into the warp and woof of the gold cloth of education's banner the threads which represent their careers stand out the brightest.

Book Reviews

International Clinics. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles On Treatment, Medicine, Surgery, Neurology, Pediatrics, Obstetrics, Gynecology, Orthopedics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene and Other Topics of Interest to Students and Practitioners. Edited by Henry W. Cattell, A.M., M.D., Philadelphia. Volume II. Thirty-fourth series, 1924. Philadelphia: J. B. Lippincott Company, 1924.

The volume covers a diversity of subjects, the greater part of which are surgical in nature. The authors have shown careful judgment in the subjects selected, and, although, at times, enthusiasm may have made deductions a little too sweeping, in the main conservatism has been the key note of each article.

New and Nonofficial Remedies, 1924. Containing descriptions of articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1923. Chicago: American Medical Association, 1924. Cloth $1.50.

The publication of "New and Nonofficial Remedies" is one of the very important functions of the American Medical Association, for in it the Council on Pharmacy and Chemistry attempts a true valuation of the recent additions to therapeutics. This is necessary because of the extravagant claims frequently sent out by the manufacturer with the samples supplied the physicians.

The 1924 edition is well up to the standard which the profession has always associated with this publication.

Annual Reprint of the Reports of the Council On Pharmacy and Chemistry of the American Medical Association, 1923. 72 pages. Chicago: American Medical Association. Cloth, postpaid, $1.00.

The purpose of this little publication is to make available to physicians, chemists and pharmacologists the official reports of the council. The present volume is largely given up to preparations which have not been accepted by the council and the reasons for their rejection.

Besides the reports of the council there are editorial comments from the "Journal of the American Medical Association" incorporated in the text. This little book should be in the hands of all physicians because it will make clearer to them why certain preparations which they may have found efficacious have not been admitted by the council.

Modern Methods of Treatment. By Logan Clendening, M.D.; Assistant Professor of Medicine, Lecturer on Therapeutics, Medical Department of the University of Kansas; Attending Physician, Kansas City General Hospital; Physician to St. Luke's Hospital; Physician to St. Mary's Hospital, Kansas City, Mo. Illustrated. 692 pages. St. Louis: C. V. Mosby Company. Cloth, $9.00.

This book covers the treatment of disease by every modern recognized method. The author seems imbued with the idea of actually helping the reader, rather than simply writing a book. Details of treatment to be found, only after laborious search through many volumes, are given here in one volume. Too many writers take for granted that the older physician is familiar with the exact method of spinal puncture, passing a stomach tube, giving a proctoclysis or doing a venesection. Dr. Clendening takes nothing for granted but goes into the actual bedside technic of practically every procedure mentioned, to the great advantage of a large number who have need for these details only occasionally.

It is refreshing, also, to find an author who retains some faith in the efficacy of drugs. Practical points in prescription writing, the choice of suitable vehicle, incompatibilities, variations in the action of similar drugs, and many other features, including many well-chosen illustrations, add to, or rather constitute, the value of this work.

After dealing in Part I with Drugs, Dietetics, Hydrotherapy, Massage, Radiotherapy and other methods of treatment, the author considers in Part II the application of these methods to particular diseases.

Well written, well edited and instructive, this is a valuable book for any physician.

The Anatomy of the Nervous System, from the standpoint of development and function. By Stephen W. Ranson, M.D., Ph.D., Professor of Anatomy in Northwestern University Medical School, Chicago. Second edition, revised. Octavo volume of 421 pages with 284 illustrations, some of them in colors. Philadelphia and London: W. B. Saunders Company, 1923. Cloth, $6.50, net.

Throughout the book the "B.N.A." has been used except in the case of some of the fiber tracts where other names have been employed for clarity.

The text figures are gathered from many sources and there are many original figures. There is a section on laboratory outlines of neuro-anatomy which should prove of value to the teacher in arranging a course. A full bibliography is appended.

Although intended primarily for the medical student it should prove of value to all those interested in nervous diseases.

The Medical Clinics of North America (Issued serially, one number every other month.) Volume XIII, No. 1, July, 1924. By Internists of New York City. Octavo of 426 pages with 106 illustrations. Philadelphia and London: W. B. Saunders Company. Paper, $12.00, net. Cloth, $16.00, net.

The present number of this publication is of great interest because of the diversity of subjects covered. The Medical Clinics have set a high standard and the present volume keeps up the high mark of excellency that the profession has been accustomed to expect in this publication. All of the clinics are well presented and of classical significance.

Love and Marriage: Normal Sex Relations. By T. W. Galloway, Ph.D., Litt.D.; Associate Director of Educational Measures, American Social Hygiene Association. New York and London: Funk & Wagnalls Company. 20 volumes. Average number of pages, 70. Price, per set, $6.00, net; per volume, 30c, net.

In another little volume of the National Health Series, the author has covered his subject clearly and simply. In the limited space the subject could not have been better presented.

Anesthesia. By James Tayloe Gwathmey, M.D.; First President of American Association of Anesthetists, Anesthetist to the New York Skin and Cancer, Columbia, and Peoples Hospitals; Fellow American Medical Association and the New York Academy of Medicine. Second revised edition, illustrated. 799 pages. New York and London: The Macmillan Company.

The whole subject of anesthesia is carefully covered, special subjects being assigned to collaborators. The indications and contra-indications of the different anesthetic agents are gone into in detail.

The sections on synergistic analgesia should be read by surgeons as well as by anesthetists. Dr. Luchardt's article on ethylene anesthesia covers this method fully.

At the present time when anesthesia is to a large extent considered one of the lesser important duties of the physician, it is fortunate that a man of the ability and professional standing of Dr. Gwathmey should still be holding this department of medicine in the place of importance it deserves.

The phraseology and lucidity of expression make the book a classic.

The Expectant Mother; Care of Her Health. By R. L. DeNormandie, M.D.; Specialist; Boston, Mass. New York and London: Funk & Wagnalls Company. 20 volumes. Average number of pages, 70. Price, per set, $6.00, net; per volume, 30c, net.

Every obstetrician has his own methods for prenatal care, but the directions given in this manual are such that they can be supplemented and need not be corrected. The advice is clear and in keeping with the teaching of modern obstetrics.

The Culture of the Abdomen. The Cure of Obesity and Constipation. By F. A. Hornibrook. 67 pages, illustrated. New York: William Wood & Co. Price, $2.25.

In modern medical practice greater emphasis is placed upon exercise, and consequently many different systems are found available. This small work is another system for developing the body and maintaining health, and is the result of years of experience which the author has had in such work. The system of exercises is original in conception, simple in execution, and definitely beneficial in the results secured. Chapters on posture, ptosis, flat feet, post-operation exercises, various systems of culture, and modern sports, are all interesting and instructive. It is a book that commends itself to the profession for its practical nature.

Venereal Diseases; Their Medical, Nursing and Community Aspects. By W. F. Snow, M.D.; General Director American Social Hygiene Association. New York and London: Funk & Wagnalls Company. 20 volumes. Average number of pages, 70. Price, per set, $6.00, net; per volume, 30c, net.

The author has been assigned one of the most difficult subjects possible to present to the lay reader. He has intentionally and correctly omitted details of the treatment of the individual case. It is well up to the standard set by other volumes of this series.

Goiter: Nonsurgical Types and Treatment. By Israel Bram, M.D.; Instructor in Clinical Medicine, Jefferson Medical College, Philadelphia, Pa.; Member of the Society for Study of Internal Secretions, Etc. 479 pages. New York: The Macmillan Company.

The author presents the symptoms of thyroid disease in a very easily remembered manner. He holds to the opinion that Grave's disease is not primarily a disease of the thyroid, and, hence, that surgical procedures are harmful in this condition. In this opinion he is not alone, for there are many men of wide experience who consider that Grave's disease is a symptom complex of which the thyroid is only a part.

The author is convinced in his own mind of the doctrines he is bringing before the profession.

It is to be regretted that under drug treatment he is too much given to polypharmacy. The book has numerous case reports which are fairly and impartially selected.

No matter what one's attitude may be in the treatment of goiter, the book should be read by all those interested in this subject.

Diabetes. A Handbook for Physicians and Their Patients. By Philip Horowitz, M.D. Second edition, revised and enlarged. 219 pages with 34 text illustrations and two colored plates. New York: Paul B. Hoeber, Inc. Cloth, $2.00, net.

This second edition, which includes the latest ideas and methods of insulin therapy, with the calculations of maintenance diet, has for its object, as in the first edition, "more intelligent co-operation between doctor and patient." It is a very helpful manual to supplement the more elaborate texts. It contains a summary of the very interesting and valuable history of diabetes which the author has investigated so thoroughly. The conditions of acidosis and coma, and other complications, are clearly discussed. Insulin and hypoglycemia, diet, hygiene and exercise, recipes, laboratory methods are topics well presented.

Insulin in General Practice. A Concise Clinical Guide for Practitioners. By A. Clark Begg, O.B.E., M.D., Ch.B., M.B. 130 pages. London: William Heinemann, 1924. Price, 5 s., net.

Of the many brief presentations of the subject of diabetes and insulin now coming from the press in great abundance, this little book is the most unique, and approaches the subject from the question and answer standpoint. Each chapter is developed to correspond to the order of studying a patient found to have glycosuria. There is a valuable discussion on the significance of sugar in the urine, and the percentage of sugar in the blood. The principles of insulin therapy as presented here correspond to our conception of the subject. There is an excellent summary of what insulin has done for the diabetic, given along with the general discussion of complications that may follow diabetes.

A Dictionary of Treatment Including Medical and Surgical Therapeutics. By Sir William Whitla, M.D., D.Sc., LL.D. M.P.; Emeritus Professor of Materia Medica and Therapeutics in Queen's University, Belfast; Hon. Physician in Ordinary to H.M. The King in Ireland. Consulting Physician to Royal Victoria, Belfast Ophthalmic, and the Ulster Hospitals for Women and Children. Seventh edition, 1100 pages. New York: Paul B. Hoeber, Inc. Cloth, $10.00.

As the title indicates, this is an alphabetical list of diseases and conditions with a rather brief discussion of remedial measures. Mention is made of the drugs and remedies used in general practice, and actual prescriptions are sprinkled well throughout the book.

Like dictionaries in general, it is of no special interest to read but valuable for reference.

Hygiene and Public Health. By George M. Price, M.D., Director, Joint Board of Sanitary Control; Director, Union Health Center, New York City. Third edition, thoroughly revised. Price, $2.25.

It seems strange that in a book written in 1924, malaria, yellow fever, and filaria should be mentioned as being claimed by a number of investigators to be water-born diseases. This paragraph should bar the book from use in any medical school.

The section on the control of communicable diseases is well written and could be read with profit by all physicians.

Handbook of Anaesthetics. By J. Stuart Ross, M.B., Ch.B., F.R.C.S.E.; Lecturer in Practical Anaesthetics, University of Edinburgh; Honorary Anaesthetist, Edinburgh Dental School. With an Introduction by Hy. Alexis Thompson, C.M.G., M.D., F.R.C.S.E.; Professor of Surgery, University of Edinburgh; and Chapters upon Local and Spinal Anaesthesia, by W. Quarry Wood, M.D., F.R.C.S.E.; Assistant Surgeon, Edinburgh Royal Infirmary; and upon Intratracheal Anaesthesia, by H. Torrance Thompson, M.D., Anaesthetist to the Leith Hospital. Second Edition. New York: William Wood & Co. Edinburgh: E.&S. Livingston. 1923. Cloth, $2.75.

In this little book of 321 pages are embraced the essentials of anesthesia. The author takes up the absorption and physiologic action of anesthetic drugs. Five chapters deal practically with shock and its treatment, as pertaining to anesthesia, under the headings, asphyxia, methods of anesthetising and the clinical observation of the patient, dealing with the stages of anesthesia and with reflexes. The chapter on the preparation of the patient takes up the usual preliminaries and also mentions some which are not so usual. The succeeding ten chapters discuss the method of administration and the action of general anesthetics: nitrous oxid, nitrous oxid and oxygen, ether, chloroform, ethyl chlorid, nitrous oxid and ethyl chlorid, and mixtures of chloroform and ether. The section on the accidents and sequellae of anesthesia deals not only with the prevention of these as far as possible, but also with the treatment when they occur. The posture of the patient during anesthesia and the choice of a suitable anesthetic under varying conditions, including anesthetics in labor, are valuable additions to the book.

Local anesthesia is treated in the same thorough and practical way: indication, agent of choice, toxicity, dosage and methods.

The seventy-one illustrations are comprised for the most part of cuts of apparatus used in anesthesia, and since these are of foreign manufacture, are not of particular interest in this country.

The book is well written and well arranged.

Epidemic Encephalitis (Encephalitis Lethargica). By Arthur J. Hall, M.A., M.D. Camb., F.R.C.P. Lond.; Professor of Medicine, University of Sheffield; Senior Physician, Sheffield Royal Hospital. 229 pages with 17 plates (one fully colored) and other illustrations. New York: Wm. Wood & Co. Price, $3.75.

The greater part of the work is based upon the Lumleian Lecture which the author delivered before the Royal College of Physicians of London in 1923.

There is an extensive bibliography containing 2056 references appended. Throughout the book one is impressed not only by the careful work and conservatism of the author, but the classical manner in which this subject is presented.

The Internal Secretions for the Use of Students and Physicians. By Dr. Arthur Weil, Assistant Professor in Physiology at the University of Halle. 287 pages. New York: The Macmillan Company, 1924.

The author has presented his subject different from the usual way in which it is handled, in that instead of making a separate description of each of the endocrin glands, he has described the physiological functions and the relation of each of the glands of internal secretion to these functions.

The Manual is clearly expressed, and throughout the book the tone of conservatism is a welcomed note.

Tuberculosis—Nature, Treatment and Prevention—By Linsly R. Williams, M.D.; Managing Director National Tuberculosis Association. New York and London: Funk & Wagnalls Co. 20 volumes. Average number of pages, 70. Price, per set, $6.00 net; per volume, 30c net.

This little manual is one of the National Health Series and keeps up the high standard that the other publications have led the profession to expect. If we consider the space allotted and the fact that it is written for laymen, it would be hard to have chosen a more perfect presentation of the subject. The author is to be congratulated in his wise decisions in leaving out matters that are still subject to controversy. He is wise also in not attempting to include in this manual after-care, occupational therapy, sanitorium sites, dispensary and sanitorium management.

Southern Medical News

ALABAMA

The first wing of the new home for the Children's Hospital, Birmingham, which is supported by the Community Chest, was opened recently.

The Nye-Hodge Hospital, Scottsboro, was recently opened.

Deaths

Dr. Howard Bierne Burwell, Huntsville, aged 44, died July 11 at South Highlands Infirmary, Birmingham, from acute nephritis.

Dr. Hamilton Moore Weedon, Troy, aged 54, died June 22.

Dr. John Wyeth Barclay, Fairfield, aged 82, died June 24.

ARKANSAS

The private hospital of Drs. Scarborough, Ogden, Judd, Zell and Moore, known as Trinity Hospital, Little Rock, was opened June 25. The hospital contains fifty beds.

The site of the Arkansas Tuberculosis Sanatorium, near Booneville, is 900 feet above sea level, among the pines. It is a beautiful spot, with good water and perfect drainage.

The first of a series of public health meetings of the Monroe County Medical Society was held at Clarendon June 10.

Deaths

Dr. J. H. Gibson, Coy, aged 60, died June 11 at Ripley, Miss., from arteriosclerosis.

Dr. Charles Cochran, Mena, aged 64, died May 31 from carcinoma.

Dr. R. M. Osborn, Fort Smith, aged 77, died June 25 at Memphis, Tenn., from cerebral hemorrhage.

Dr. Louis C. DeWoody, Hot Springs, aged 56, died June 30 at St. Joseph's Infirmary, following an operation.

DISTRICT OF COLUMBIA

Dr. John A. Foote, Professor of Diseases of Children, Georgetown University School of Medicine, Washington, was recently elected a member of the Board of Trustees of the National Geographic Society.

The American Congress of Internal Medicine will meet in Washington in 1925. Dr. William Gerry Morgan, Washington, is President of the Congress and is Chairman of the Executive Committee in charge of arrangements for the meeting.

Dr. Tom A. Williams, Washington, will give a series of Mental Hygiene Clinics in Pennsylvania beginning September 15. These have been arranged under the auspices of the Woman's Welfare Association in Washington, of which Dr. Williams is Director of the Clinic of Nervous Disorders and Mental Hygiene.

Dr. W. Calhoun Stirling announces his removal from Winston-Salem, N. C., to Washington, where he will practice his specialty of genito-urinary surgery.

Deaths

Dr. Ralph A. Hamilton, Washington, aged 51, died June 21.

FLORIDA

Dr. John Alexander Coleman, Miami, and Miss Mary Matthews Dabney, Richmond, were married June 24.

Deaths

Dr. Harvey Lucius Montgomery, Micanopy, aged 48, died June 18 at Asheville, N. C., from mitral regurgitation.

GEORGIA

Carroll County Medical Society has elected Dr. W. P. Smith, Bowdon, President; Dr. O. W. Roberts, Carrollton, Vice-President; Dr. D. S. Reese, Carrollton, Secretary-Treasurer.

Dooly County Medical Society has elected Dr. H. A. Mobley, Vienna, President; Dr. T. F. Bivins, Vienna, Vice-President; Dr. P. E. Williams, Vienna, Secretary-Treasurer.

Glynn County Medical Society has elected Dr. J. A. Dunwoody, Brunswick, President; Dr. R. E. L. Burford, Brunswick, Vice-President; Dr. J. P. Harrell, Brunswick, Secretary-Treasurer.

Lamar County Medical Society has elected Dr. C. H. Willis, Barnesville, President; Dr. C. E. Suggs, Barnesville, Vice-President; Dr. John M. Anderson, Barnesville, Secretary-Treasurer.

Madison County Medical Society has elected Dr. H. H. Hampton, Colbert, President; Dr. W. D. Gholston, Danielsville, Secretary-Treasurer.

Mitchell County Medical Society has elected Dr. B. Williams, Pelham, President; Dr. F. L. Lewis, Camilla, Vice-President; Dr. C. L. Roles, Camilla, Secretary-Treasurer.

Putnam County Medical Society has elected Dr. V. H. Taliaferro, Eatonton, President; Dr. E. T. Griffith, Eatonton, Vice-President; Dr. S. A. Clark, Eatonton, Secretary-Treasurer.

Screven County Medical Society has elected Dr. W. R. Lovett, Sylvania, President; Dr. J. C. Call, Sylvania, Vice-President; Dr. A. B. Reddick, Sylvania, Secretary-Treasurer.

Spalding County Medical Society has elected Dr. A. H. Frye, Griffin, President; Dr. E. R. Anthony, Jr., Griffin, Vice-President; Dr. T. I. Hawkins, Griffin, Secretary-Treasurer.

Wayne County Medical Society has elected Dr. A. J. Gorden, Jessup, President; Dr. T. G. Ritch, Jessup, Vice-President; Dr. J. T. Colvin, Secretary-Treasurer.

The State Board of Health, cooperating with U. S. Public Health Service, held its Fifth Annual Institute-Clinic on Venereal Diseases in June. This was held in conjunction with Emory University Medical Alumni Week.

At the meeting of the Chattahoochee Valley Medical Society held in Warm Springs in July, the Fourth District Medical Society was reorganized. The following officers were elected: Dr. Mercer Blanchard, Columbus, President; Dr. Wallace H. Clark, LaGrange, Vice-President; Dr. Francis Burton Blackmar, Columbus, Secretary-Treasurer. The next meeting will be held in LaGrange.

Dr. Benjamin B. Steedy has been appointed Director of the new Steiner Cancer Clinic, Atlanta, in connection with the Grady Hospital. The Steiner Clinic Building was made possible by the will of the late Albert Steiner, who left $500,000 for the erection and maintenance of the building.

Dr. Clara Benson, formerly Pathologist to the Henry Ford Hospital, Detroit, Mich., has been appointed Pathologist at the Macon Hospital.

During the last school year the School of Medicine of Emory University received gifts totaling $51,500, which were applied to operating expenses.

The second annual meeting of the Penitentiary Camp Physicians' Association of Georgia met at Rome June 18. The following officers were elected: Dr. R. L. Miller, Waynesboro, President; Dr. J. H. Mull, Rome, Vice-President; Dr. Warren A. Coleman, Eastman, Secretary-Treasurer.

A bill has been introduced in the State Legislature to provide the sum of $25,000 for a new water supply for the Georgia Training School for Girls, near Atlanta. At present water is obtained from springs which are polluted. The State Board of Health has recommended that the springs be abandoned and that mains be laid to connect the school with the water supply of Atlanta.

Dr. R. V. Patterson, who recently completed his service as interne at Memorial Hospital, Richmond, Va., has accepted a position with the house staff of the Georgia Baptist Hospital, Atlanta.

Six thousand dollars' worth of roentgen-ray equipment was recently installed in the Emory University division of the Grady Municipal Hospital, Atlanta.

It has been announced that Millen will have another hospital. A site has been leased and work has begun.

Dr. J. H. Nicholson, Madison, has been appointed Chief Resident Surgeon at the Chester Hospital, Chester Pa., for the next twelve months, after which time he will return to Georgia.

The Wesley Memorial Hospital, Atlanta, became an integral part of Emory University last December.

Dr. Jackson Wiley Landham, Atlanta, and Miss Belle Moon were married June 14.

Dr. Julian Killen Quattlebaum, Savannah, and Miss Helen Burkhalter were married June 21.

Deaths

Dr. John E. Norton, Cleveland, aged 55, died June 12, following a long illness.

Dr. Joseph B. Tanner, Cataula, aged 55, died June 23 at the Columbus City Hospital from cerebral hemorrhage.

Dr. William H. Godwin, Bullochville, aged 65, died June 26 from chronic nephritis and chronic myocarditis.

Dr. Elizabeth Wallace Smith, Atlanta, aged 71, died May 15 at Berkeley, Calif.

Dr. Jabez Frank Roughton, Atlanta, aged 70, died June 11.

Dr. Capers N. Wilson, Maysville, aged 66, died June 27 from chronic nephritis.

KENTUCKY

The Central Kentucky Medical Society, comprising the counties of Boyle, Mercer, Lincoln and Garrard, has reorganized after a lapse of seven years. The Society was organ-

ized in 1867 and held quarterly meetings regularly until 1917, when practically its entire membership entered the Army to engage in the World War. The last set of former officers was re-elected. They are as follows: Dr. Virgil G. Kinnaird, Lancaster, President; Dr. Greene L. Johnson, Harrodsburg, Vice-President; Dr. John T. Price, Harrodsburg, Secretary.

The Hazlewood State Tuberculosis Sanatorium, Louisville, is open for the reception of fifty more patients. Recent improvements on the sanatorium cost $30,000. It has a total capacity of 100 beds and Dr. Samuel W. Bates is Superintendent.

Miss Lelah D. Gibson is the new Superintendent of Massie Memorial Hospital, Paris.

Deaths

Dr. Charles Z. Aud, Cecilia, aged 78, died July 15.

Dr. William C. Stephens, Whitley City, aged 70, died June 18.

Dr. Arthur H. Robbins, Mount Sterling, aged 62, was killed June 23 when struck by lightning.

Dr. Preston Peter, Louisville, aged 87, died June 28.

LOUISIANA

A new system of quarantine inspection has been decided on for fruit boats bound to New Orleans from Central America which are known to be free from quarantinable diseases. A new station will be established at the mouth of the river. This will prevent loss from delay and from deterioration of fruit in hot weather, and will put New Orleans on a par with New York and other Northern ports in the rapid handling of fruit.

The National Leprosarium at Carville, founded in 1894, was formerly a planter's mansion. The patients live in cottages, each in a separate room, and the cottages are connected. It is reported that the Director of the Leprosarium has stated that more than forty lepers treated at Carville have been cured and returned to their homes. The capacity of the institution is about 200.

The New Orleans Medical and Surgical Journal has been adopted by the Mississippi State Medical Association as its official organ.

The Ducros bill recently signed by the Governor requires that the male applicant for a marriage license must be examined by a licensed physician not more than fifteen days before the license to marry is applied for. The physician cannot charge more than $2.00 for making the examination.

Dr. W. C. Rucker, Surgeon, U. S. Public Health Service, will take charge of the new Marine Hospital, New Orleans.

The Southern Baptist Hospital Commission will in the near future erect an eight-story hospital in New Orleans at a cost of $750,000. Work on other buildings of the hospital plant, which will cost $2,000,000, will start as soon as practicable. At the annual meeting of the Commission, Dr. L. J. Bristow, Superintendent of the Alabama Hospital, Selma, Ala., was elected Superintendent of this new Baptist Hospital.

It has been announced that Charity Hospital, New Orleans, has received donations amounting to $20,744 to cover the deficit in the Hospital fund.

Dr. Sambola J. Couvillon has been elected Mayor of Moreauville.

The new staff of the Shreveport Charity Hospital has been installed. Dr. W. P. Morrill is Superintendent; Dr. Lambert, of last year's staff, is Chief Surgical Resident, and Dr. William J. Norfleet, of Suffolk, Va., is the new Chief Medical Resident; Dr. McBride, formerly with Tulane, is Assistant to Dr. Lambert; there is also a full quota of interns.

At the commencement exercises of Loyola University, New Orleans, the honorary degree of LL.D. was conferred on Dr. James T. Nix.

Dr. William J. Sandidge, Shreveport, has been re-elected Health Officer of Caddo Parish.

Deaths

Dr. Joseph Powell Tenney, Reserve, aged 37, died June 13 at a sanatorium in Memphis, Tenn.

MARYLAND

Ground will soon be broken for the erection of a new hospital and administration building for the Eudowood Sanatorium, Towson. It will be a three-story structure with twelve private rooms, operating rooms and offices, and will cost about $100,000.

A new baby clinic has been opened in Baltimore. Dr. Herman J. Dorf is in charge. This clinic brings the total of such stations operating in Baltimore to fifty-six.

Dr. Arthur G. Barrett has donated a room at West Baltimore General Hospital, Baltimore, in memory of his father.

The following appointments have been made at the Colonial Hospital, Baltimore: Dr. Arthur C. Monninger, Resident Surgeon; Dr. Leo B. Schlenger, Senior Interne, and Drs. Henry H. Simpson, Joseph Wisner and E. H. Adler, Interns. The Hospital was a year old in June. Plans are now being made to enlarge the Hospital.

Seven tons of food, most of which was canned goods, were condemned July 16 by Baltimore City Health Department inspectors. More than six tons of canned goods were condemned at a fruit and vegetable packing plant in Canton. Improper methods of canning was the cause of the food being spoiled.

Drs. Robert H. Riley, with the State Department of Health, and J. H. Mason Knox, Chief of the Bureau of Child Hygiene, are making a tour of inspection of the clinics established in the counties of the western part of the State.

Dr. David I. Macht, Lecturer in Pharmacology and Therapeutics, Johns Hopkins University Medical Department, Baltimore, has had the degree of Doctor of Pharmacy conferred on him by the University of Maryland.

Dr. Arthur E. Pattrell, Executive Officer, Boston Psychopathic Hospital, has been made Superintendent of the Sheppard and Enock Pratt Hospital, Towson.

Dr. M. V. MacMillan has been appointed Community Manager of the U. S. Veterans' Bureau Rehabilitation Center No. 2, Perry Point. He was Director of Field Hospitals in France with the Forty-second Division.

Dr. S. T. Darling, Baltimore, was elected President of the American Society of Tropical Medicine at the annual convention in Chicago, June 9-10.

Dr. Arthur P. Herring, Commissioner of Mental Hygiene of Maryland, has begun making a tour of inspection of all county homes.

Deaths

Dr. William McCarter Wright, Baltimore, aged 57, died July 18.

Dr. George Henry Brown, New Windsor, aged 81, died June 23 from pneumonia.

MISSISSIPPI

The Mississippi State Medical Association, at its recent annual meeting, adopted the New Orleans Medical and Surgical Journal as its official organ.

Dr. Robert S. Curry, Jackson, member of the Legislature from Hinds County, resigned recently to accept the position of State Factory Inspector.

Deaths

Dr. W. A. Whitten, Keownville, aged 69, died June 14.

Dr. James R. Murnan, Shelby, aged 57, died June 18.

MISSOURI

Southeast Missouri Medical Association held its forty-eighth annual session at Charleston May 27-28. Dr. G. W. Vinyard, Jackson, was elected President; Dr. G. C. Cannon, Fornfelt, Vice-President; Dr. W. S. Love, Charleston, Recording Secretary; Dr. S. C. Slaughter, Fredericktown, Corresponding Secretary; Dr. W. R. Goodycoontz, Cape Girardeau, Treasurer.

Stoddard County Medical Society has elected Dr. T. C. Allen, Bernie, President; Dr. J. L. Craig, Dexter, Vice-President; Dr. W. C. Dieckman, Dexter, Secretary; Dr. S. S. Davis, Bloomfield, Treasurer.

Tentative plans for the removal of the University of Missouri School of Medicine from Columbia to Kansas City are being prepared for presentation to the Board of Curators. The school only gives instruction covering the first two years in medicine. The Dean has stated there is agitation to establish the last two years.

Dr. Emmett F. Hoctor, Nevada, has been appointed Superintendent of State Hospital No. 3, at Nevada, succeeding Dr. R. C. Robertson, Acting Superintendent.

Dr. Joseph Blacklar and Miss Rose Mary Shuchert, both of St. Louis, were married June 27.

Dr. George Edwin Cecil and Mrs. Maud A. White, both of Flat River, were married June 17.

Dr. Avery Ala Drake and Miss Mary Genevieve Wilson, both of Laredo, were married in June.

Deaths

Dr. George W. Griffin, Fair Play, aged 79, died July 7 from heart disease and asthma.

(Continued on page 36)

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Anodyne
Expectorant

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Sedatole is a palatable and exceptionally efficient sedative expectorant combination of Tolu, Sanguinaria, Squills, Wild Cherry and Balm of Gilead Buds, together with 1-64 grain of Diacetyl Morphine to the fluidrachm.

Sedatole exerts a dependable sedative, anodyne and expectorant action upon the congested membrane of the throat and bronchial tract, thereby materially lessening the paroxysms of coughing, and aiding in the relief of the inflamed condition by increasing expectoration.

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2 cc without case	$2.25
With case and needles	2.75
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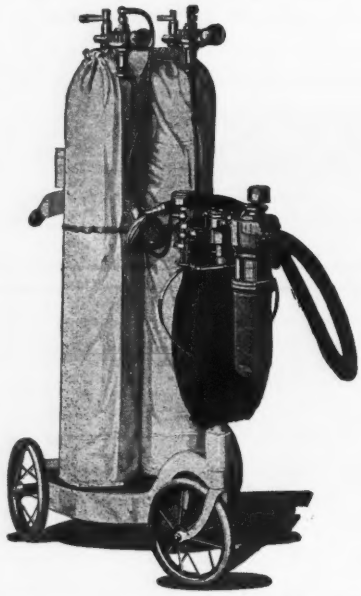

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(Continued from page 742)

Dr. William Bert Reynolds, Rockville, aged 49, died July 14 at St. Joseph's Hospital, St. Joseph, following an appendectomy.

Dr. Thomas G. Hunt, St. Louis, aged 55, died June 30.

Dr. William Nifong, Fredericktown, aged 82, died July 1.

Dr. Henry Lloyd, St. Joseph, aged 58, died May 30 at a local hospital from acute nephritis.

Dr. William Archibald McCandless, St. Louis, aged 74, died June 25.

Dr. Jonas G. Allen, Grant City, aged 72, died June 7 from cholecystitis.

Dr. George R. Wallace, Bertrand, aged 52, died June 24 at St. Mary's Infirmary, Cairo, Ill., from carcinoma of the gall bladder.

Dr. John B. Martin, Sr., Russellville, aged 89, died June 22.

Dr. Charles Adam Federman, Kansas City, aged 54, died suddenly May 31 from cerebral hemorrhage.

NORTH CAROLINA

Onslow County has contracted for the erection of a fireproof county home for indigents. The home is so planned that when desired it may be converted into the county hospital.

The new City Memorial Hospital, Winston-Salem, was recently opened. The Hospital now has a bed capacity of 225.

The Baptist Hospital, Charlotte, was recently opened.

The Pitt Community Hospital, Greenville, was opened June 1. It is a three-story building and has a capacity for forty patients.

Drs. Gaul and Myers, of the Alonzo Myers Orthopedic Clinic, Charlotte, announce that they will conduct the Orthopedic Clinic of the Presbyterian Hospital, Charlotte, each Friday afternoon, commencing July 25.

Davidson Hospital, High Point, was recently opened.

Dr. Henry H. Briggs, Asheville, was awarded one of the three prizes given at the annual session of the Association of Surgeons of the Southern Railway Company recently held in Jacksonville, Fla., for the best original contribution presented.

(Continued on page 38)

Neosalvarsan

HA M E T Z LAB
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"The Dependable Original"

Made in the United States in strict conformity with Ehrlich's processes and formulas. Government tested.

Our obligation of responsible helpfulness towards practitioner and patient is being fulfilled through the medium of lowered prices of Neosalvarsan possible by quantity production.

I.	0.15 gram	$.60 per ampule
II.	0.3 "	.65 " "
III.	0.45 "	.70 " "
IV.	0.6 "	.80 " "
V.	0.75 "	.90 " "
VI.	0.9 "	1.00 " "

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Neosalvarsan, the dependable original, is unsurpassed in low toxicity and is unequalled in therapeutic effectiveness. These facts have been demonstrated through extensive use during the past thirteen years and constitute a unique record.

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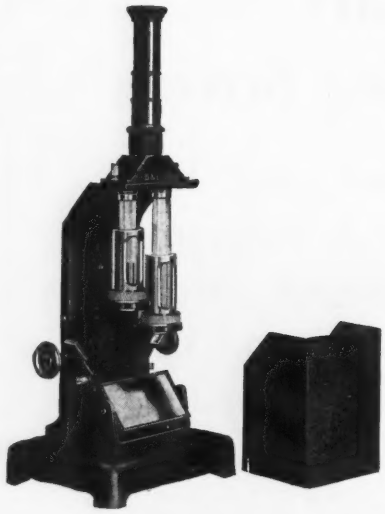

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(Continued from page 36)

The Guilford County Medical Society has adopted a resolution endorsing the action of the County Board of Health in its effort to create one county health organization in combining the County with Greensboro and High Point.

Dr. W. Calhoun Stirling, Winston-Salem, announces his removal to Washington, D. C. He will continue to practice his specialty of genito-urinary surgery.

Dr. Paul Frederick Whitaker, Kingston, and Miss Pocahontas Farrar Lipscombe, Richmond, Va., were married June 11.

Deaths

Dr. J. W. Colvard, Jefferson, aged 67, died June 7 at a hospital in Richmond, Va.

Dr. Elias Fulp, Fulp, aged 65, died June 17.

Dr. Thomas J. Call, North Wilkesboro, aged 58, died suddenly April 16 at Fleetwood from cerebral hemorrhage.

Dr. Frederick Lawrence Siler, Franklin, aged 53, died June 7 at a hospital in Atlanta, Ga., following an appendectomy.

Dr. Alexander Archie Bulla, Jackson Hill, aged 62, died recently.

Dr. Euel H. Lyon, Bahama, aged 49, died July 6 at the Watts Hospital, West Durham, following a long illness.

Dr. Matthew Locke McCorkle, Newton, aged 81, died June 25, following a long illness.

Dr. Hillary Madison Wilder, Charlotte, aged 73, died June 15 from heart disease.

Dr. John Taylor Williams, Charlotte, died suddenly June 8 from cerebral hemorrhage.

OKLAHOMA

Recent improvements costing nearly $100,000 have been made at the Eastern Oklahoma State Tuberculosis Sanatorium, Talihina. Improvements include a recreational hall, electric light plant and additional wards.

Dr. Carl Puckett, State Commissioner of Health, announces that arrangements are being perfected whereby Oklahoma physicians will be supplied with printed forms,

(Continued on page 40)

Erythrol Tetranitrate Merck

Asthma
Angina Pectoris
Arteriosclerosis
Cardiac Diseases

Literature on request

Merck & Co.

45 PARK PLACE NEW YORK

Overcoming Mal-nutrition in Infants and Children

Zsigmondy determined that pure gelatine is the most powerful of the protective colloids. (*Zsigmondy, Z. Anal. Chem., 40; 1901.*)

In the recent research of the specific uses of pure gelatine in the dietary, conducted by T. B. Downey, Ph.D.—Fellow at the Mellon Institute, University of Pittsburgh, it was conclusively proved by standard feeding tests that 1% of pure plain gelatine dissolved and added to cow's milk, will increase by 23% the nourishment obtainable from that milk.

This dietary discovery gives gelatine inestimable value in infant feeding because it promotes the complete absorption of the milk nutriment with the minimum of digestive effort and goes a long way toward the prevention of colic, regurgitation, and bowel disorders in the bottle-fed baby.

The prescribed formula for modification of milk with gelatine is as follows:

Soak for ten minutes one level tablespoonful of Knox Sparkling Gelatine in ½ cup of cold milk taken from the baby's formula; cover while soaking; then place the cup in boiling water, stirring until gelatine is fully dissolved; add this dissolved gelatine to the quart of cold milk or regular formula.

FREE—To Physicians and Hospitals

We shall be glad to send free, upon request, scientific reports on the health value of gelatine with additional copies of the above formula for milk modification, together with valuable recipes for gelatine dishes useful in the dietary.

In addition to the family size packages of "Plain Sparkling" and "Sparkling Acidulated" (which latter contains a special envelope of lemon flavoring,) Knox Sparkling Gelatine is put up in 1 and 5 pound cartons for special hospital use.

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"The Highest Quality for Health"

Chas. B. Knox Gelatine Laboratories
408 Knox Avenue, Johnstown, N. Y.

Free from harmful acidity, artificial coloring, and synthetic flavoring.

The Ella Oliver Refuge

A refined Christian home for the care and protection of unfortunate girls during pregnancy and confinement.

Under the auspices of the Women's and Young Women's Christian Associations of this city.

Adoption of babies arranged for when desired.

Patients may have house physician or any other ethical physician.

Charges very reasonable.

Strictest privacy is maintained.

For folder and further information, address

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HIGH POWER
Electric Centrifuges

Send for Cat Cn

INTERNATIONAL EQUIPMENT CO.
253 Western Ave., Boston, Mass.

(Continued from page 38)

with postage attached, for reporting communicable diseases. This will enable physicians to give information more quickly and with less effort. Reports may be made to any city, county or state health officer.

The State Commissioner of Health announced that Dr. David T. Bowden, Jr., has been appointed to direct the co-operative efforts of the State and the International Health Board. Dr. Bowden will supervise the work of full-time county health units that are being established.

The Commissioners of Muskogee County have decided to establish a full-time public health service. This will be the fourth county in the State to have model full-time county health departments, the other counties being Carter, LeFlore and Okmulgee.

The addition to Tisdal Hospital, Elk City, has been completed and is now being furnished.

Dr. S. P. Ross has been appointed Chief Surgeon for the Oklahoma City and Atoka Railroad, with headquarters at Ada.

Dr. Edward Halsell Fite, Muskogee, and Miss Elizabeth Coleman Williams, Charlottesville, Va., were married June 18.

Deaths

Dr. Rice M. Shaw, Oklahoma City, aged 50, died June 30.

Dr. John Angus Gillis, Frederick, aged 58, died June 19 at a hospital in Oklahoma City.

Dr. Percy A. Smithe, Enid, aged 46, was drowned July 21 in Little River, near Nashoba, while on a vacation trip.

SOUTH CAROLINA

Dr. Charles R. F. Beall has been elected Medical Director at Waverley Sanitarium, Columbia.

Dr. James E. Daniel, Greenville, has been promoted from

(Continued on page 42)

THE HANOVIA QUARTZ LAMPS

THE ALPINE SUN
THE KROMAYER

Pioneers in 1905—Standard of the World Today

With the famous Hanovia standard burners, of the entire quartz, mercury anode type—superiority of design and construction combines to give an unparalleled therapeutic scope.

These Lamps enjoy a reputation for longer life and therapeutic power.

Read of the Medical Profession's work in Asthma, Hay Fever, Tetany, Rickets, Tuberculosis, Eye, Ear, Nose and Throat, G. U., and others.

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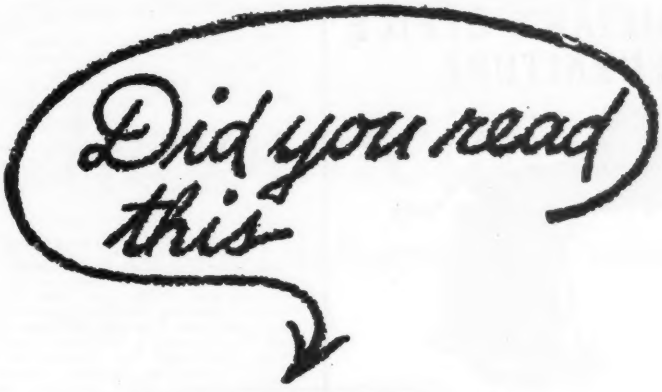
Branch Offices: New York, Chicago, San Francisco

Burners and all parts manufactured in our own Plant.



LOST USE OF FOREARM, SUES DOCTOR FOR $10,000

That he treated her for rheumatism when she had a broken wrist, as a result of which she has lost the locomotion of her right forearm, is the complaint of [redacted] who yesterday filed suit in circuit court against [redacted] physician, demanding $10,000 damages. The plaintiff alleges that because of the negligent treatment she is now so crippled that she cannot keep employment. The suit is filed by Attorney [redacted]

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IMPROVED HANES TABLE

for Rectal and General Examinations and Treatments. This table has been greatly improved. It can be equipped with adjustable slide stirrups and our new Bierhoff crutches.

Write for Catalog

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931 No. Ala. St. Indianapolis

(Continued from page 40)

Lieutenant-Colonel to Colonel in the Medical Officers' Reserve Corps.

Dr. Walter H. Shealy, Batesville, has assumed his duties with the Cherokee County Health Department, succeeding Dr. Walter Boone, Jr., Gaffney.

Dr. James Brown, Jr., Greenville, and Miss Mabel Estelle Elder, Baltimore, Md., were married June 30.

Deaths

Dr. Walter D. Ouzts, Johnston, aged 65, died June 19.

Dr. Laurens H. Irby, Woodruff, aged 59, died suddenly July 12 from cerebral hemorrhage.

Dr. Benjamin H. Knotts, Orangeburg, aged 87, died June 25.

TENNESSEE

The Board of Trust of Vanderbilt University, Nashville, has made the following appointments to the medical faculty to take effect in 1925: Dr. Glenn E. Cullen, Associate Professor of Research Medicine, University of Pennsylvania, has been appointed Professor of Biological Chemistry; Dr. Ernest W. Goodpasture, Director of the Singer Memorial Laboratory, Pittsburgh, Pa., Professor of Pathology; Dr. Robert Sidney Cunningham, Associate Professor of Anatomy, Johns Hopkins Medical School, Baltimore, Md., Professor of Anatomy; Dr. James M. Neill, Assistant Rockefeller Institute, Associate Professor of Bacteriology. During the present year Drs. Cullen and Goodpasture will study in Europe and Dr. Neill will study in this Country on grants awarded them by the General Education Board, New York, while Dr. Cunningham will continue his work at Johns Hopkins.

The Chattanooga District Medical Association, which embraces north Georgia and north Alabama, as well as the area around Chattanooga, will have its fall meeting in Chattanooga.

The Obion County Court has voted to retain for the ensuing year the services of the County Health Unit and voted $2,875 to pay the County's part of the expense. The health unit in the County is maintained through the cooperation of the County Court and the State Board of Health. Montgomery County will retain its health unit; and Bedford

(Continued on page 44)

The Management of an Infant's Diet

Mellin's Food . . . . 4 level tablespoonfuls
Water (boiled, then cooled) . **16 fluidounces**

furnishes a suitable diet for temporary nourishment during the acute stages of intestinal disturbances of infants generally referred to by the term.

Summer Diarrhea.

While the condition of the baby will guide the physician in regard to the administration of the above mixture, the usual custom is to feed 1 to 3 ounces every hour or two until the stools lessen in number and improve in character. The food mixture may then be gradually strengthened by substituting one ounce of skimmed milk for one ounce of water until the amount of skimmed milk is equal to the quantity of milk usually employed in normal conditions.

Mellin's Food Co., 177 State Street Boston, Mass.

Announcing

The New Engeln Diathermy Equipment

MORE than a quarter of a century's service and experience in the manufacture of X-Ray and Physical Therapy Equipment is behind the new and complete line of Diathermy Apparatus which we now offer to the Medical Profession.

THE HILL X-RAY COMPANY
39 Forrest Avenue
ATLANTA, GA.

DIETETIC SCALE

DIETETIC SCALE, $10.00

Capacity, 500 Grams by 2 Grams

Sturdily constructed, sanitary, accurate, can be readily carried from room to room, as platform and post slips in bottom of scale. Easy to use. Place dish on platform and rotate dial until "0" is exactly under end of pointer. Place helping of food on plate until proper number of grams is registered. Again rotate dial until "0" is under end of pointer, and weigh another portion of food on the plate. No computation or deduction for tare. Porcelain top. White enamel washable body and dial. Used by hospitals and sanitariums, as well as by individuals.

We are prepared to equip completely laboratories for the purpose of doing Blood and Urine Chemical Analysis.

Let us submit our list of Apparatus, Chemicals and Solutions for your approval.

INSULIN OR ILETIN

We carry in stock for immediate shipment at all times a supply of Insulin or Iletin, made in the laboratories of Eli Lilly & Co.

Mail Orders Given Special Attention.

DOSTER-NORTHINGTON DRUG COMPANY

Surgical Instruments, Hospital, X-Ray and Laboratory Supplies

BIRMINGHAM, ALA.

(Continued from page 42)

and Hamilton Counties their nursing bureaus; Coffee County has installed a Bureau of Maternity and Infant Hygiene.

The gold medal of the University of Tennessee College of Medicine, Memphis, was awarded to Dr. Charles L. Chumley. The member of the graduating class who has shown the most proficiency in his work receives this medal, which is awarded annually.

Dr. W. L. McCreary was re-elected President of the Tennessee State Board of Medical Examiners at its annual meeting held in Nashville in July.

Miss Rosa Van Vort has concluded her six months' organization work at St. Elizabeth's Hospital, Richmond, Va., in which hospital she has inaugurated the training school for nurses, and will take up the reorganization work of the Knoxville General Hospital.

Dr. James J. Durrett, City Health Superintendent, Memphis, was recently appointed Registrar of Vital Statistics for the City. He succeeds Dr. James J. Neely.

Deaths

Dr. John Clinton Eskew, Mount Juliet, aged 84, died July 7 from senility.

Dr. Newton C. Ellis, Friendsville, aged 56, died June 25 at the Knoxville General Hospital, following an appendectomy.

Dr. James T. Ward, Centerville, aged 69, died June 15, following an operation for gangrene of the foot.

Dr. James Madison Masters, Newport, aged 72, died suddenly June 26 from heart disease.

Dr. Henry F. Hudson, Greenfield, aged 77, died June 30.

TEXAS

The North Texas Medical Association met at Decatur June 24-25.

The Seventh District Medical Society met in Austin July 3. The next meeting will be held at Austin in February.

(Continued on page 46)

QUALITY *First*—SERVICE *Always*

Account for beneficial clinical results physicians obtain by prescribing

CHEPLIN'S
B. Acidophilus Milk

(Produced under the direct supervision of Harry A. Cheplin, Ph.D.)

FOR

Intestinal Toxemia

CHEPLIN'S B. ACIDOPHILUS MILK will be found of distinct value in the treatment of intestinal toxemias. It provides an effective means of overcoming putrefactive processes in the intestines and regulating bowel movements.

14-oz. Bottles A. M. A. Council Accepted

Clinical improvement is manifested by relieving co-existing toxic symptoms of headache, fatigue and intestinal gas.

CULTURE—CHEPLIN'S B. ACIDOPHILUS MILK contains approximately 250,000,000 viable and potent acidophilus bacilli per c. c. Physicians who subjected it to a bacteriological test have recognized its superior qualities.

SERVICE—Culture is shipped direct to physicians or their patients by express or parcel post on the day of receipt of order. Arrangements can be made whereby weekly shipments will go forward regularly, thus insuring a continuous and fresh supply. Culture prepared daily—never out-of-date.

PRICE—Six 14-oz. bottles, $2.00; twelve 14-oz. bottles, $3.75, plus delivery charges.

Full Information and Sample on Request

Cheplin Biological Laboratories, Inc., Syracuse, N. Y.

THE RADIO KNIFE

The New Surgical Instrument

It cuts clean; does not burn but seals like a cautery
Much of the bleeding is eliminated
Sterilizes tissue as it is separated
Wounds heal rapidly without sloughing

This instrument attracted widespread interest among the members of the medical profession when exhibited and demonstrated for the first time at the American Medical Association Meeting in Chicago.

It is used in surgical dissections of all kinds such as Appendectomy, Prostatectomy, Cancer of the Breast, Tonsillectomy, etc.

For further information write your surgical supply house or any of the following representatives of the Acme-International X-Ray Co.

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TREATMENT CHAIR

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For Treatment and Examining

Raises—Revolves—Reclines

New design base. Many new features. Beautiful in appearance and efficient in operation.

Write for circular.

THE MAX WOCHER & SON CO.

Surgical Instruments—Furniture

29-31 West Sixth Street CINCINNATI, OHIO

(Continued from page 44)

The Twelfth District Medical Society met at Marlin July 8.

A forty thousand dollar hospital is to be erected at Graham in the near future. Mr. M. K. Graham donated one-half of the cost of the hospital and the other half is donated by citizens of Graham.

The new Jefferson Davis Hospital, Houston, is planning to erect a $25,000 nurses' home, a $25,000 isolation ward, and venereal disease clinic to cost $10,000.

The General Hospital, Fort Sam Houston, plans an addition of buildings to house 600 patients. Plans are also being made for an adequate laboratory equipment which will meet the needs of approximately 1000 patients.

Dr. Robert B. Homan is planning to erect a hospital in El Paso at a cost of $157,000.

Plans are being made to erect the James Autry, Jr., Memorial Hospital and School near the Tuberculosis Hospital, Houston. This will cost $50,000 and will be used to treat tuberculous children.

The Ennis Hospital, Ennis, will soon be completed at a cost of approximately $50,000.

The Provident Sanitarium, Waco, opened a free clinic July 2. It will provide treatment for all poor people unable to pay for medical services.

Recently the Harris County Health Association on Sanitation and Disease Prevention was formed with an appropriation of $12,600 a year. The Rockefeller Foundation will pay $5000 of this annually and the County the remainder. A full-time physician, three inspectors and a nurse will be employed. The work will be done under the auspices of the State Health Association.

Texas druggists are being asked to support the campaign to raise a $500,000 fund for the erection of a new building for the University of Texas College of Pharmacy, at Galveston. The hospital will be known as the Cline Pharmacy Memorial.

The National Committee for Mental Hygiene is conducting a mental hygiene survey of the State. This will be done in three sections. The first section deals with penal institutions; the second comprising the five state hospitals for mental diseases, the State Colony for Feeble-minded and the State Epileptic Colony; the third section will include

(Continued on page 48)

Laboratories of

Drs. Bunce, Landham and Klugh

ATLANTA, GEORGIA

DEPARTMENTS

PATHOLOGY — Allen H. Bunce, A.B., M.D., F.A.C.P.

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These laboratories are equipped for making every test of clinical value in the diagnostic study of medical and surgical cases. Only standardized methods and technique are used.

In addition to the diagnostic study of cases there are adequate facilities for the x-ray and radium treatment of conditions in which these forms of treatment are indicated.

Fee lists and containers for pathological specimens and information in reference to x-ray and radium work furnished upon request.

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TENS OF THOUSANDS NOW USE THE

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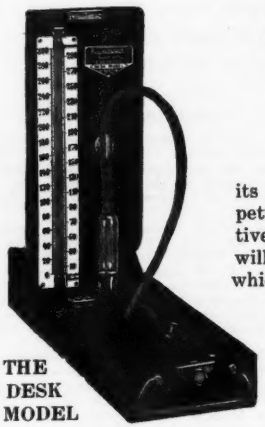

THE DESK MODEL

its unvarying accuracy (perpetually guaranteed), sensitive response to the user's will, and that utter simplicity which makes it so very easy to operate and so hard to get "out of order," combine to make it the splendid, serviceable instrument which users know it to be.

DESK MODEL 300 mm. calibration	$32.00
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SUPPLIED THROUGH YOUR DEALER

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When a Pelton Boils Dry—

—your Sterilizer is unharmed, for all "PELTONS" have one-piece copper boilers without solder, and any amount of dry heat will not injure them.

—and your instruments, instead of rusting in rapidly cooling water, are completely dried and awaiting your next requirement.

The "PELTON" Automatic Safety Switch shuts off the current before your instruments are harmed.

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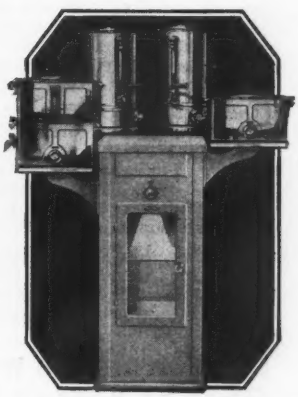


The Pelton "LINCOLN MODEL" Sterilizer. No. 1616

In any Combination to meet your requirements.

(Continued from page 46)

3000 public school children and the children in four state institutions for dependent and delinquent children.

A complete file of the Texas Medical Journal has been presented to the Medical Branch of the University of Texas by Miss Fannie Daniel, Austin, in memory of her father, the late Dr. F. E. Daniel, founder and editor of the Journal.

Deaths

Dr. Charles Franklin Wilson, Memphis, aged 67, died June 11.

Dr. John Thomas Fitzsimon, Castroville, aged 62, died June 28.

Dr. Charles E. Heartsill, Marshall, aged 55, died in June, following a long illness.

VIRGINIA

The annual meeting of the Medical Society of Virginia will be held in Staunton October 14-17. Dr. W. W. Chaffin, Pulaski, is President of the Society. Endocrinology has been selected as the subject of the symposium. Dr. A. F. Robertson, Jr., Staunton, is Chairman of the local Committee of Arrangements.

Alexandria Medical Society reorganized at a meeting at Alexandria recently. Meetings will be held on the first Tuesday night of each month. Dr. M. D. Delaney was elected President; Dr. F. M. Daillard, Vice-President; Dr. W. C. West, Secretary-Treasurer.

At the meeting of the American Gynecological Society recently held in Hot Springs, Dr. Howard C. Taylor, New York, was elected President; Dr. Arthur C. Curtis, Chicago, Secretary.

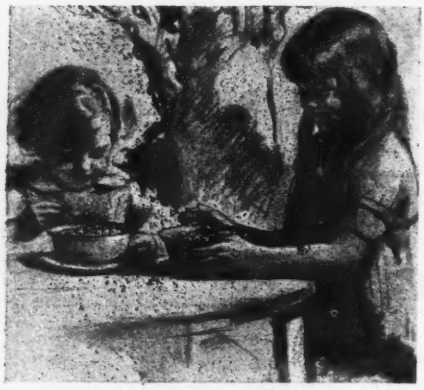
Powhatan County Medical Society was reorganized on June 5. Dr. T. S. Hening, Jefferson, was elected President; Dr. R. D. Tucker, Powhatan, Vice-President; Dr. J. E. Tilman, Rock Castle, Secretary.

Southside Virginia Medical Association held its regular quarterly meeting at Victoria June 17.

Surry County Medical Society, at its meeting on June 10, elected Dr. E. M. Easley, Bacon's Castle, President; Dr. J. H. Parker, Dendron, Secretary; Dr. W. L. Devany, Dendron, Treasurer.

At the meeting of the Roanoke College Alumni Association last month Drs. W. R. Whitman, Roanoke, and Nat. Copenhaver, Bristol, were elected Vice-Presidents.

(Continued on page 50)



Your little patients who need whole grains

—Delight them with "Foods Shot From Guns"

Children who can't be coaxed to eat the usual cereal dishes revel in Quaker Puffed Wheat and Puffed Rice.

Each kernel is a confection with the flavor of nutmeats. But—such wholesome, nutritious confections, whole grains puffed to eight times normal size, every food cell broken to insure quick, easy digestion and assimilation.

Quaker Puffed Grains can be served in an almost endless variety of enticing ways. With sugar and cream, floated in bowls of milk, with fresh or canned fruit. As a between-meal treat, mothers offer a bowl buttered and salted like popcorn.

Adults also like Puffed Grains served these same ways. For the brain-worker they make a sleep invoking bedtime dish which puts no strain on the digestion.

Quaker Puffed Wheat
Quaker Puffed Rice

A NEW ACCURACY IN BLOOD PRESSURE READINGS

Baumanometer

So gravely important are blood pressure readings successful physicians take no chances. Thousands have laid aside old instruments and adopted the Baumanometer for greater accuracy.

$2.00 BRINGS IT TO YOU

Employing Nature's Immutable Law Insures Absolute Accuracy

The unfailing reliability of gravitation method made use of. The scale of every instrument individually hand calibrated, another fundamental of scientific accuracy. Cannot spill; no air-pockets. The variation of other instruments of 10 to 30 mm. impossible.

Dr. Janeway, Johns Hopkins, Recommends It

Rockefeller Institute, Mayo Clinic, Yale and Harvard Medical Schools and many others use it. Metropolitan Life Insurance Co. bought 1000. Portable desk model (14½x4¾x2½ inches). With Free Manual.

10 DAYS' TRIAL—EASY TERMS

Send just $2.00 and we will forward it to you at once. Try it. If not thoroughly satisfied return and get your money back. If perfectly satisfied, send the balance in ten monthly installments of $3.00 each; without interest—$32.00 in all complete, which is the regular cash price everywhere.

SIGN AND MAIL COUPON

A. S. ALOE CO., 581 OLIVE ST., ST. LOUIS, MO.

I enclose first payment, $2.00. Send Baumanometer complete on 10-days' trial. If I keep it, I will pay balance, $30.00, in 10 monthly payments of $3.00, without interest. I agree title remains in you until paid in full.

Name.....

Address.....

—WHAT IS THE BACTERIAL COUNT OF THE MILK YOU USE?—

The standard quality of cow's milk seems to be set according to the bacteria per cubic centimeter, and the allowable score by the American Association of Medical Milk Commissions for Certified Milk is 10,000 per c. c.—On grades A and B the standards are 50,000 to 100,000 and as clinical data shows, sometimes it runs over, often up to the million mark.

DRYCO has an average bacteria count of 15 per c. c., consequently it represents one of the greatest advances in milk production in the past ten years. DRYCO—always uniform and dependable, has taken out every weak link in the chain of safety of milk production.

DRYCO is not only a safe milk with the lowest bacteria count, but possesses the highest nutritive value.

It would seem logical whenever milk is required, to prescribe that form of milk which is absolutely safe and of the highest nutritive value. **DRYCO is available everywhere.**

Will gladly send samples and literature on request.

THE DRY MILK COMPANY, 18 Park Row, NEW YORK, N. Y.

"An International Institution for the Study and Production of Pure Milk Products"

It's Sharp BARD-PARKER KNIFE *It's Sharp*

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To Our Customers

The Bard-Parker Knife Products are now being distributed and sold by us only through authorized Agents.

The Agency Plan provides better than twenty-four-hour service by reason of adequate stocks maintained in our Agent's hands in practically every city of the United States.

Addresses of the Agents nearest to you cheerfully furnished upon request.

No. 12

BARD-PARKER COMPANY, Inc.

150 Lafayette St. **New York City.**

(Continued from page 48)

The Governor has appointed the following as members of the new State Board of Health: Drs. Henry M. Miles, Norton, two years; W. M. Smith, Berryville, three years; Guy R. Harrison, D.D.S., Richmond, four years; William T. Graham, Richmond, five years; George B. Lawson, Roanoke, six years; Lawrence T. Royster, University of Virginia, Department of Medicine, Charlottesville, seven years; John T. Daniels, Cape Charles, one year. The Board is now composed of seven instead of fourteen members.

The new home for nurses at Catawba Sanatorium has been completed and can care for forty-two nurses.

The following have been appointed members of the Health and Sanitation Committee of the Community League of Strasburg: Drs. H. T. Hopewell, B. R. White and G. G. Crawford.

Dr. Paul Redd, Richmond, has been elected a member of the Committee on Health and Sanitation of the Highland Park Citizens' Association.

Dr. Beverley R. Tucker, Richmond, was recently ac-

(Continued on page 52)

Oats and Milk

—*the "Better Breakfast"*

IT'S the ideal health breakfast—oats and milk—and the most savory, if Quaker Oats are served.

For *Quaker* means quality. The large, tender flakes give an extra tempting, rich yet delicate flavor to the morning porridge.

The calories, proteins and minerals which make oats one of the most valuable of all cereal foods are offered in the form of a dainty. When you urge mothers to serve oats, tell them to be sure these oats are *Quaker*.

Quaker Oats are flaked from the finest grain grown—from big, plump kernels selected for super-quality. We get only about 10 pounds to a bushel. That's why culinary experts always say *Quaker* when they order oats.

Standard full size and weight packages—
Medium: **1¼ pounds;**
Large: **3 pounds, 7 oz.**

Quick Quaker

Cooks in 3 to 5 minutes

Quaker Oats

The kind you have always known.

CLASSIFIED ADVERTISEMENTS

WANTED—WOMAN LABORATORY TECHNICIAN and x-ray technician for twenty-five bed hospital. Good salary and maintenance. Address The Clinic, Macon, Ga.

Trade Mark Registered.
Gluten Flour
40% GLUTEN
Guaranteed to comply in all respects to standard requirements of U. S. Dept. of Agriculture.
Manufactured by
FARWELL & RHINES
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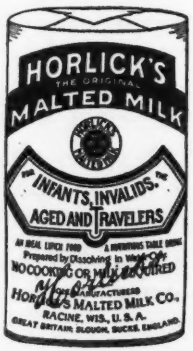
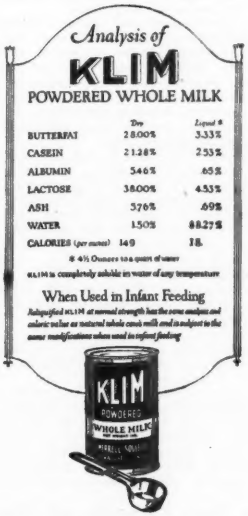
Uniformly Reliable in the Dietetic Treatment of Your Patients

The Original



Avoid Imitations

Prescribed extensively because of its proved nutriment advantages.



Recognizing the importance of scientific control, all contact with the laity is predicated on the policy that KLIM be used in infant feeding only according to a physician's formula. If not available to your patients we will supply your pharmacist upon your recommendation.

Basic facts about KLIM in Infant Feeding

KLIM is whole milk—pure and uniform—from which the water has been removed. In it the nutritive properties of fresh cow's milk are retained in highly assimilative form.

It is the basis for safe and simplified infant feeding and so closely conserves the flavor and the natural properties of milk that it is the ideal milk for the growing child.

Literature and samples sent upon request

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Also Makers of Merrell-Soule Powdered Protein Milk

In Canada KLIM and Merrell-Soule Powdered Protein Milk are made by Canadian Milk Products, Ltd., 347 Adelaide St., West, Toronto

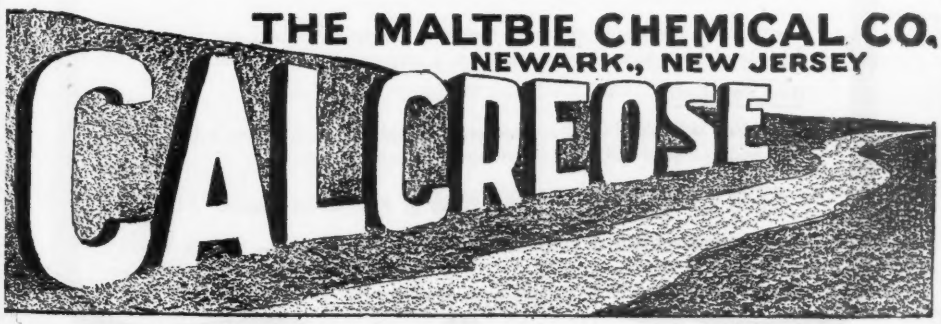
General Medication in Tuberculosis

"CALCIUM—Certain it is, that patients, especially children, often improve with increased amounts of calcium in their food or as a medicament."

"CREOSOTE—It seems to be true that many patients have improved appetite under its stimulant or irritant action in the stomach. It may also for a time improve digestion, and the patient often adds weight. During this period there is frequently a lessening of the bronchitis, and, therefore, a decreased expectoration, and with this decrease of the secondary (streptococcic) infection, there is likely to be less fever and, therefore, less sweating."—A. M. A.: "Handbook of Therapy," Ed. 6, p. 201.

CALCREOSE (calcium creosotate) is a mixture containing in a loose chemical combination approximately equal weights of creosote and lime. It has the pharmacologic activity of creosote but apparently does not have any untoward effect on the stomach.

Samples of Tablets on Request



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(Continued from page 50)

claimed poet laureate of the Edgar Allan Poe Shrine at a meeting of the Board of Directors.

It has been announced that during the last two years the Bureau of Rehabilitation of Richmond has investigated 500 cases of handicapped persons, of whom more than 100 have been placed in training and about 50 satisfactorily employed. There are seventy-five persons in training at this time. The average cost for each person trained is about $166, which includes salaries and expenses of employees and overhead charges of the Bureau. Artificial limbs were purchased for seventy-five persons.

Dr. D. Wright Kelly, Jr., Culpepper, who graduated from the Medical College of Virginia this year, has been appointed an interne of the hospital at Hazard, Ky.

U. S. Base Hospital No. 45 (McGuire Unit) recently issued a history of its activities from the inception of the plan for its organization to the time the men were mustered out. It covers 352 pages and contains 200 photographs.

Dr. Walter Brownley Foster has been appointed Director of Public Welfare and Chief Health Officer of Richmond, thus combining the offices held by Drs. Ernest C. Levy and C. Curtis Hudson.

The Union Bank and Trust Company, Petersburg, formed by the consolidation of two large banking institutions of that city, has elected Drs. J. M. Williams and W. P. Hoy on the Board of Directors.

At the organization meeting of the Virginia Historic Highway Association at Lynchburg in June, Dr. S. L. Scott, Fredericksburg, was elected one of the Vice-Presidents.

Dr. William Ambrose McGee, Jr., and Miss Louis Marie Johnson, both of Richmond, were married June 24.

Dr. William P. Gilmer, Clifton Forge, and Miss Catherine Newman, Baldwin, Miss., were married June 2 at Seone, Korea.

Dr. Allen Moore Kimbrough and Miss Carrie Nelson Berkeley, both of Richmond, were married June 17.

Deaths

Dr. Alvah S. Hudson, Westpoint, aged 44, died suddenly June 29.

Dr. John P. Cleveland, Glasgow, died June 30 from cerebral hemorrhage.

(Continued on page 54)

Elixir of Veronal

"Veronal" Trademark Reg. U. S. Pat. Off.

Agreeable **Efficient**
Convenient **Stable**

Veronal is more extensively prescribed than any other synthetic hypnotic, because of its well-established efficiency in a large variety of diseases of nervous or organic character.

Owing to its insolubility and bitter taste it is best given in the Elixir containing 2 grains of Veronal to the teaspoonful in a very pleasant and stable solution.

How Supplied:

Elixir of Veronal in 12 oz. bottles. Veronal in 5 grain tablets, tubes of 10 and bottles of 100, and in powder in ounces.

Literature and Sample of Elixir of Veronal on Request

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WINTHROP PRODUCTS
Conform to Original BAYER High Standards

A new radium technic for Cancer of Oesophagus offers greater palliation.

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The place of CELESTINS Vichy in the dietary is distinctive and important. It is an alkaline water of diuretic action, and is indicated in cases of the following:

Chronic hepatic disorders; gastric and intestinal indigestions; acid dyspepsia; chronic catarrhal gastritis or enteritis; rheumatism; diabetes; inflammation of the bladder; and a large number of minor ailments.

CELESTINS VICHY is bottled only at Vichy, France, under the direct supervision of the French Government. Order and insist upon getting CELESTINS VICHY.

A booklet on the therapeutic uses of CELESTINS Vichy will be sent on request.

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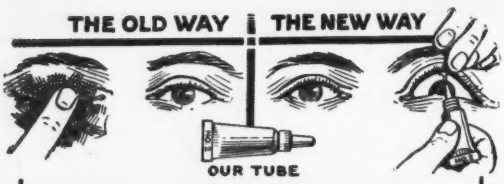

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Can be obtained by the use of "M-E-S-Co" brand of Ophthalmic Ointments. **Reasons: Selected Chemicals, Thorough Trituration, Perfect Incorporation, Sterilized Tubes, Boiled and Strained Petrolatum, Excellent Service, No Waste, No Dirty Salve Jar, Right Prices.** Write for complete information.

MANHATTAN EYE SALVE CO., Inc.
Louisville, Ky.

(Continued from page 52)

Dr. James White Cummings, Abingdon, aged 66, died July 9.

Dr. Samuel S. Simpson, Clarendon, aged 60, died the latter part of May in Washington, D. C.

WEST VIRGINIA

At the recent annual meeting of the Ohio County Medical Society at Wheeling, Dr. Edward S. Bippus was elected President; Dr. John E. Marschner, Vice-President; Dr. Harry W. Bond, Secretary.

The Rife-Ferguson Hospital, the first hospital to be established in Kenova, will be opened some time in August. The Hospital is owned, controlled and supervised by Dr. J. W. Rife, Kenova, and Dr. J. W. Ferguson, Westmoreland. The cost of the Hospital was not announced.

St. Edward's College, Highlawn, is to be converted into a hospital. Alterations and additions to cost approximately $12,000 are now being made.

The following officers of the Medical Officers' Reserve Corps, United States Army, were ordered to active duty July 7-21. These were to report for training to the Medical Field Service School, Carlisle Barracks, Pennsylvania: Colonel George Fordham, Wyco; Lieut.-Col. John H. Shaffer, Montgomery; Lieut.-Col. Walter E. Vest, Huntington; Major Oscar Beer, Buckhannon; Major Orra F. Covert, Moundsville; Major Lurty N. Harris, Wheeling; Major Hugh G. Nicholson, Charleston.

Dr. Page Dameron Barlow, McMechen, was elected one of the Vice-Presidents of the B. & O. Surgeons at the recent meeting in Pittsburgh.

Dr. L. V. Guthrie, Superintendent of the Huntington State Hospital, was re-elected Auditor of the American Psychiatric Association at its meeting held in Atlantic City in June.

Dr. Alfred Filmore Compton and Miss Evangeline Henderson, both of Moundsville, were married recently.

Deaths

Dr. Frederick W. Hill, Fairmont, aged 60, died July 8, following a long illness.

Dr. George W. Dudding, Hurricane, aged 86, died June 27 from senility.

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LOESER'S INTRAVENOUS SOLUTIONS
CERTIFIED

Original research, long association, and service, have indelibly and inseparably stamped the name "Loeser" on the subject of intravenous solutions.

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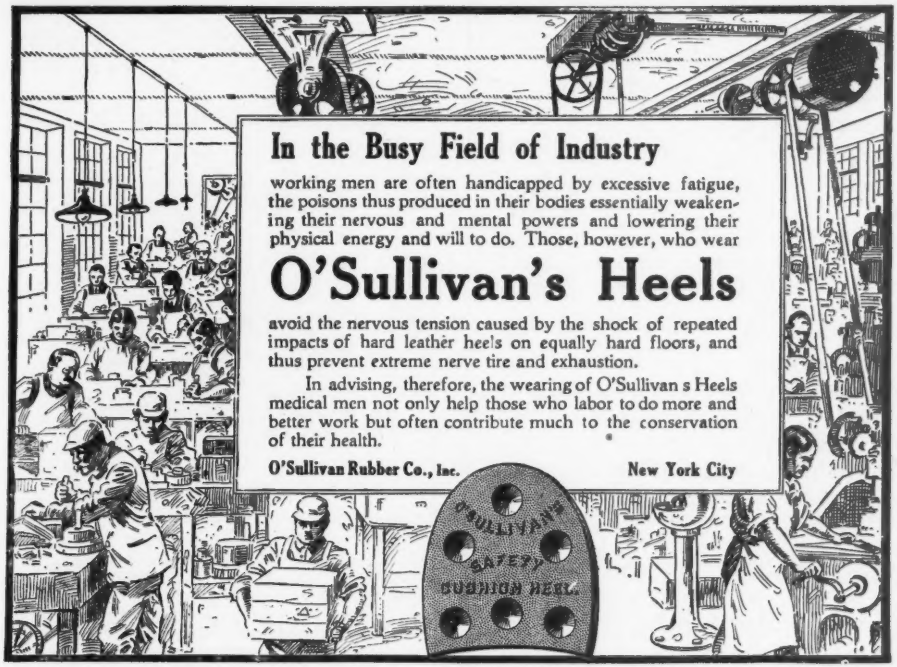
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working men are often handicapped by excessive fatigue, the poisons thus produced in their bodies essentially weakening their nervous and mental powers and lowering their physical energy and will to do. Those, however, who wear
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avoid the nervous tension caused by the shock of repeated impacts of hard leather heels on equally hard floors, and thus prevent extreme nerve tire and exhaustion.
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can be effective only through the use of dependable endocrine products. The reputation and integrity of the manufacturer is the physician's only guarantee of reliability of those organotherapeutic products for which there is no chemical or biological assay. Every manufacturing process and all our product is supervised by our Analytical and Research Department.

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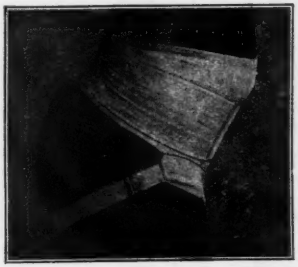

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ACRIFLAVINE has been shown to be a more powerful antiseptic, in serum, than bichloride or phenol.

SOLUTABS ACRIFLAVINE P-M CO are superior to other forms of the chemical for medicinal use, in that

They are more quickly soluble.
They permit use of freshly made solutions.
They yield solutions of accurate strength.
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Each Solutab contains Acriflavine 1-37/100 grs., making 3 ozs., of solution 1:1000 (proper injection strength) or 1 pint of solution suitable for lavage.

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Solutabs Acriflavine 1-37/100 grs., P-M Co are hand-moulded, disintegrate quickly and dissolve readily. Supplied in packages of 5 tubes of 10 tablets each. Write for literature.

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By far the largest majority of children that are brought to hospitals suffering from severe nutritional disturbances are victims of serious errors made by parents who failed to consult their physicians, and who attempted to feed their babies without a doctor's advice.

If all babies were under a competent physician's care, infant mortality would be surprisingly reduced.

MEAD JOHNSON AND COMPANY realize that the *physician is the only one capable of feeding babies successfully.* MEAD'S INFANT DIET MATERIALS, therefore, have no directions on the package, the mother gets her feeding instructions *only* from her doctor and follows his advice throughout the feeding period.

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Mead's Infant Diet Materials are advertised only to physicians. No feeding directions accompany trade packages. Information in regard to feeding is supplied to the mother by written instructions from her doctor, who changes the feedings from time to time to meet the nutritional requirements of the growing infant. Literature furnished only to physicians.

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From the finest quality of digitalis leaves, assayed. Leaves selected for their freshness, color, and content of active principle.

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The tincture is 150% U. S. P. strength. A dose of 10 minims is therefore equal to 15 minims of the official tincture.

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It is fat-free. Not apt to irritate the stomach.

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Supplied in 1-ounce amber bottles only. To prevent prolonged exposure to the air after opening the bottle.

V.

Containers charged with carbon dioxide to protect the tincture from atmospheric oxygen. Tincture Digitalis loses activity quite readily by the oxidizing action of the air.

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Physiologically standardized by the Houghton frog-heart method. Chemical tests are unreliable.

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